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APPLICABLE TO INSTRUMENTS
WITH SERIAL NUMBERS 121
AND ABOVE

CE-72
SIGNAL GENERATOR

MAINTENANCE MANUAL

MP MASTER
MA31807

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* Cathode ray tubes and batteries excluded.

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SECTION 1
THEORY OF OPERATION

INTRODUCTION

1.01 In this section the Circuit Reference Series for circuit and component identification is explained, the overall functioning of the instrument is outlined and a description of the individual circuits is given.

CIRCUIT REFERENCE SERIES

1.02 The circuits of the CE-72 are referred to by circuit reference numbers as follows: 1000, 1100, 2200, Front Panel, Frequency and Display circuits; 2000, 2100, 3000, Main Chassis and Mother Board circuits; 3100-3400 Frequency Synthesizer circuits; 1200, 3500-3900, Power Output and Control; 2300, Power Supply, and 4000, Rear Panel circuits.

1.03 In each circuit the components are individually numbered. The complete identification for a component includes the circuit reference number. Thus the first resistor on TCXO/Reference Divider will be R3101, the third transistor Q3101, etc.

1.04 When the individual circuits are described in the Circuit Description section the component reference will be abbreviated. Only the circuit component number will be used, except when referring to a component in another circuit. In this case the full Circuit Reference Series number will be used.

1.05 Table 3-1 is a cross reference list of the PC board numbers and the Circuit Reference Series numbers. The PC board number is etched on each board. Each board may thus be identified. These numbers and also the assembly number will be found in the Parts Lists also.

SPECIFICATIONS

1.06 The specifications of the CE-72 Signal Generator are given in Table 1-1.

FUNCTIONAL DESCRIPTION

1.07 The CE-72 functions in a manner similar to a superheterodyne receiver, except that it generates an output signal. Refer to Overall Block Diagrams, Figures 1-2, 1-3, 1-4. Two frequencies are generated by the Synthesizer, one a variable frequency 50.7 MHz to 75.7 MHz and the other a fixed frequency of 50.7 MHz. These frequencies are mixed to provide the output frequency of 1 kHz - 25 MHz. Figure 1-2, 1-3. These frequencies are derived from a Temperature Controlled Crystal Oscillator (TCXO), either by direct division or by being phase locked to a TCXO derived frequency.

1.08 The 50.7-75.7 MHz variable frequency may be fed in from either the CE-70 or the CE-71 when the CE-72 is used in the tracking mode with either the CE-70 alone or with the CE-70 and the CE-71 when all three units are used together. In either tracking mode the fixed frequency (50.7 MHz) is derived from a 10 MHz signal fed in from the CE-70.

1.09 Output from the synthesizer is amplified by a power amplifier. The output level is controlled over a range of -79 dBm to +10 dBm by two precision step attenuators, one 10 dB, and the other 1 dB per step. In addition there is a FINE control which adjusts the level over a range of ± 1 dB. Output is internally levelled to within 0.02 dB except on the extreme ranges.

1.10 The frequency synthesizer contains three offset and two summing phase lock loops, each of which is referenced to the crystal oscillator frequency source. The offset loops are controlled by three programmable dividers which in turn are controlled by the seven front panel digital frequency selector switches. See Figures 1-3, 1-4. This provides frequency control from 1 kHz to 25 MHz in 10 Hz steps.

1.11 The Frequency and Level displays are also controlled by the corresponding Front Panel switches through the display logic. See Figure 1-4.

CIRCUIT DESCRIPTION

1.12 The Frequency Synthesizer is made up of the High Frequency Phase Lock Loop, 3400, the Low Frequency Phase Lock Loop, 3300, and the Programmable Divider, 3200. The Programmable Divider is controlled by the Front Panel Frequency Digital Dial switches. See Block Diagram Figures 1-3, 1-4.

1.13 The variable L.O. frequency is generated in the synthesizer circuit which consists of three offset phase lock loops, two summing phase lock loops and three divide circuits in the Programmable Divider, the division ratios of which are determined by the setting of the Front Panel Frequency Selector rotary digital switches. The divide-by-P ratio is set by the 10 and 100 digit switches, the divide-by-M by the 1 kHz and 10 kHz digit switches and the divide-by-N by the 100 kHz, 1 MHz and 10 MHz digit switches.

1.14 The Offset Phase Lock Loops (PLL) are made up of a Voltage Controlled Oscillator (VCO), a Mixer and a Phase Detector. The VCO output is mixed with an accurate fixed frequency from the 10 MHz Ref/Divider circuit, the output frequency is divided down to a fixed output of 1 kHz, 10 kHz or 100 kHz by the Programmable Divider where it is compared with a signal from the 10 MHz Ref/Divider, of the same frequency, in the Phase Detector. Phase Detector output is DC, which controls the VCO. Thus each offset Loop VCO is controlled by the Front Panel Frequency Selector switches and is compared to the Reference frequencies.

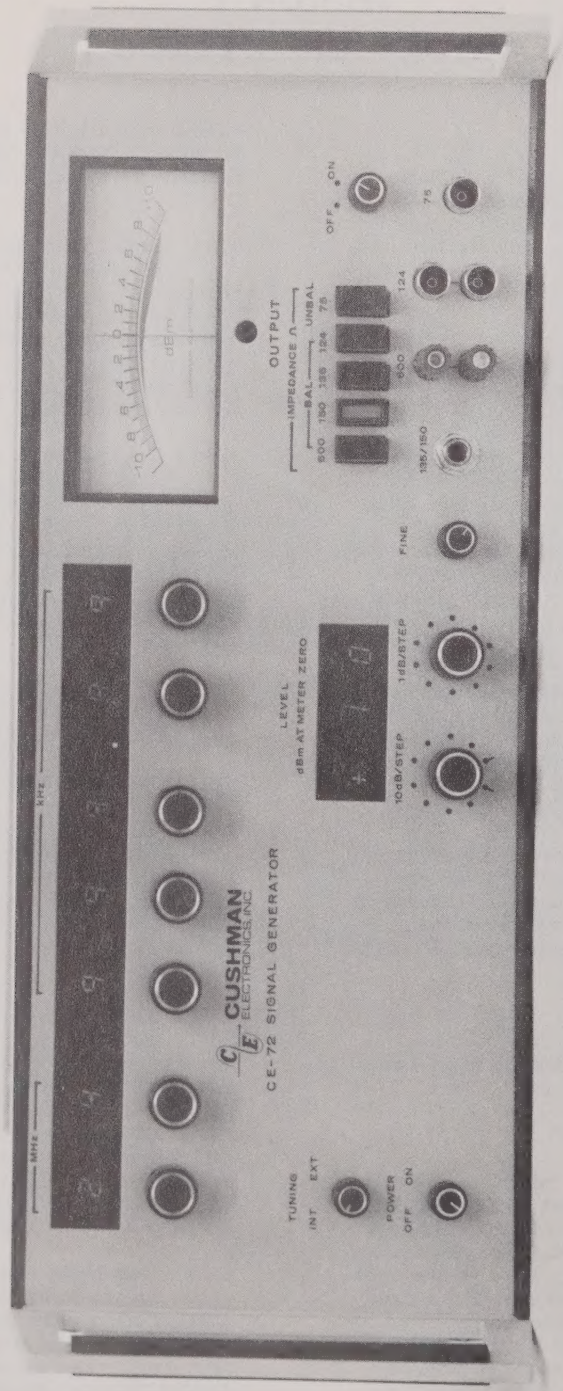


Figure 1-1. Model CE-72 Signal Generator

Table 1-1. CE-72 Specifications

ITEM	CHARACTERISTICS
FREQUENCY	
Range	
75Ω	1 kHz to 25 MHz
124Ω	60 kHz to 11.5 MHz
135Ω	10 kHz to 3.2 MHz
150Ω (optional)	10 kHz to 5.0 MHz
600Ω	1 kHz to 650 kHz
Accuracy	
25°C	±2 PPM
0° to 55°C	±3 PPM
Aging Error	<5 PPM/Year
Resolution	10 Hz
Modes of Operation	
Internal	Fixed Tune Mode
External	
Manual	Controlled by CE-70
Sweep	Controlled by CE-71
LEVEL	
Range (for 0 dB on the meter)	-79 to +10 dBm
Accuracy, 75Ω (Ref. to 0 dB on meter)	
INT Tuning, 25°C ± 5°C	
10 kHz to 18.6 MHz	
0 dBm	±0.10 dB
+1 to +10 dBm	±0.15 dB
-79 to 0 dBm	±0.20 dB
18.6 to 25 MHz	
-79 to +10 dBm	±0.25 dB
1 kHz to 10 kHz	
-60 to +10 dBm	±0.20 dB
-79 to -61 dBm	±0.40 dB
INT Tuning, 0°C to +55°C	±0.10 dB additional
EXT Tuning, CE-72 Integrated with CE-70 in TONE Mode, 25°C ± 5°C	
10 kHz to 18.6 MHz	
-69 dBm to +10 dBm	±0.20 dB
-79 dBm to -69 dBm	±0.30 dB
18.6 MHz to 25.0 MHz	
-69 dBm to +10 dBm	±0.30 dB
1 kHz to 10 kHz	
-69 dBm to +10 dBm	±0.35 dB
EXT Tuning, 0°C to +55°C	±0.10 dB additional
Accuracy, 124, 135, 600Ω	
25°C ± 5°C	±0.10 dB additional to 75Ω
0°C to +55°C	±0.15 dB additional to 75Ω
Accuracy, 150Ω (optional)	
25°C ± 5°C	±0.15 dB additional to 75Ω
0°C to +55°C	±0.20 dB additional to 75Ω

Table 1-1. CE-72 Specifications (cont'd)

ITEM	CHARACTERISTICS
Digital Readout Resolution	1 dB
Analog Meter	
Range	-1 dB to +1 dB
Resolution	±0.02 dB
Linearity Error	±0.02 dB
Fine Control	
Range	±1 dB
OUTPUT	
Impedance	
Unbalanced	75Ω
Balanced	
Standard unit	124, 135, 600Ω
Optional unit	135, 150, 600Ω
Return Loss for Signals ≤0 dBm	
75Ω	>30 dB
124, 135, 600Ω (150Ω optional)	>30 dB except for 1st octave of frequency range >27 dB including 1st octave of frequency range
Return Loss for Signal	
0 dBm to +5 dBm	>25 dB
+5 dBm to +10 dBm	>20 dB nominal
SPECTRAL PURITY	
Harmonic Distortion	>40 dB below fundamental
Spurious and Sideband Signals	
300 Hz to 1 MHz away from carrier	>55 dB below carrier, nominal
Phase Jitter (100 kHz to 25 MHz)	
20 Hz to 300 Hz band from carrier	0.5° P-P nominal
Phase Noise, dB below carrier in 10 Hz BW	
300 Hz to 3 kHz away from carrier	>65 dB down nominal
3 kHz to 30 kHz away from carrier	>75 dB down nominal
>30 kHz away from carrier	>80 dB down nominal
INTERNAL REFERENCE OSCILLATOR	10.0000 MHz
EXTERNAL TIME BASE INPUT (Rear Connector BB)	
Frequency	10.0000 MHz
Level	-10 dBm ± 2 dB into 50Ω
EXTERNAL LOCAL OSCILLATOR INPUT (Rear Connector)	
Frequency	50.7 to 75.7 MHz
Level	-10 dBm ± 4 dB into 50Ω
REMOTE CONTROL OF MODE OF OPERATION	
Sweep	Ground on center conductor of LO INPUT
Manual	Open or +5V on center conductor of LO INPUT
POWER REQUIREMENTS	115V/230V AC ± 10% switchable 50 to 60 Hz, 80 VA nominal

Table 1-1. CE-72 Specifications (cont'd)

ITEM	CHARACTERISTICS
DIMENSIONS	7 3/4" (19.7cm), 17 3/4" (45.1cm), 22" (55.9cm)
WEIGHT	40 lbs.
ENVIRONMENTAL	
Temperature, Operating Storage	0°C to +55°C -40°C to +75°C

1.15 The two summing phase lock loops, also made up of a VCO, Mixer and Phase Detector, combine the outputs of the Offset PLL's to generate an L.O. which is directly compared to frequencies derived from the 10 MHz Temperature Compensated Crystal Oscillator (TCXO). In this way each frequency dialed up is directly related to the TCXO accuracy.

Low Frequency Phase Lock Loop. 3300

Offset Loop E

1.16 This loop is controlled by the setting of the 10 and 100 Hz Frequency Selector dials which control the ÷P ratio. See Figures 1-3, 1-4. The VCO in this loop (E), covers a frequency range of 10.200 to 10.101 MHz or 99 kHz. Q21, CR11, L15 make up this VCO. See Figure 3-14. VCO output goes to the Directional Coupler, T3, to VCO buffer, Q23, to the Mixer T5, T6, CR13-16.

1.17 The other input to the mixer is the 10 MHz reference signal which enters through J1, to Power Splitter T7, to 10 MHz Amplifier Q29 and then to Mixer Transformer T6. Mixer output, 200 to 101.1 kHz then passes through the 5 MHz LP Filter, L18, L19, C90-C92, to output amplifier Q28, Q34 and out through P2-4 to the ÷P circuit.

1.18 Output from the ÷P circuit returns through P2-8. The frequency will be 1 kHz when the VCO frequency is correct. This frequency passes through driver Q32 to Phase Detector U11. The other input to U11 is the 1 kHz Reference frequency. If the ÷P frequency differs from the 1 kHz reference frequency a DC output will be produced by U11, the polarity depending on the direction in which the frequencies differ. This output is amplified by U10 passed through the 1 kHz notch filter, C107-C110, R143, R144, R164 to remove 1 kHz components and through active 500 Hz and 700 Hz low pass filters, Q24, Q25, Q27 to remove other AC components and then to the VCO Varicap CR11.

1.19 The other VCO output through directional coupler T3 is buffered through Q22 and Q26 to the ÷100 counter-divider, U8, U9, to produce a 102.00 to 101.01 kHz output to summing Loop C Phase Detector. The other 10 MHz output from power splitter T7 goes to the Mixer in Loop D as a reference frequency.

Offset Loop D

1.20 This VCO, Q10, L13, CR8, CR9 produces a frequency of 14.98-13.99 MHz which is buffered through Q11, Q12 to the Mixer, T1, T2 CR4-CR7. See Figure 3-13. The other input to the mixer is the reference 10 MHz from the power splitter, T7 (Figure 3-14). Mixer output of 4.98-3.99 MHz goes through the 7 MHz Low Pass Filter C28-C32, L11, L12 to output amplifier, Q7, Q8, to the ÷M circuit through P2-19. The 10 kHz output from ÷M enters through P2-21 to driver Q20 and to the phase detector U7. The other input to the phase detector is the reference 10 kHz frequency through P1-11 and driver Q19 to phase detector U7.

1.21 Another output from the VCO is taken through Q11, Q13 to a ÷10 counter-divider U5. The 1.498-1.399 MHz output is applied to the mixer in summing Loop C.

Summing Loop C

1.22 Loop C VCO Q1, Q2, L7, CR1, CR2, 1.6 MHz to 1.5 MHz output is buffered through Q3, Q4, Q5. Output from Q5 is applied to Mixer U3, the other input being the 1.498-1.399 MHz from Loop D. Mixer output of 102.00 to 101.01 kHz passes through 200 kHz LP Filter L9, L10, C20-C22 and is buffered through Q6, amplified by Q18 and applied to phase detector U4. The other input to U4 is the 102.00 to 101.01 kHz from Loop E. Any error voltage developed in the phase detector U4 is amplified by U2 and applied to the VCO Varicaps CR1, CR2. The other VCO 1.6 MHz to 1.5 MHz output through buffer Q4 is fed to Loop A in the High Frequency PLL circuit through J2.

1.23 The +5 volt supply for the integrated circuits is supplied through the board regulator U1. The -15V and +15V supplies are divided into three circuits and decoupled by C1, L1, L2, L3 and C2, L4, L5, L6 respectively.

High Frequency Phase Lock Loop. 3400

Offset Loop B

1.24 VCO3, Q24, CR12, L17, 52.3-62.3 MHz and VCO4, Q27, CR13, L19, 62.3-77.3 MHz cover the frequency range of this loop. See Figure 3-16. Q28 is the output buffer for VCO3 and Q29 is

the buffer for VCO4. VCO3 is used for CE-70 input frequencies of 0-9.9999 MHz and VCO4 for 10-25 MHz. The VCOs are controlled by the outputs of the 1 MHz and 10 MHz Front Panel Frequency Selector Switches.

1.25 Switching logic is on the 3400 board. CR8, CR9, Q18, Q20 sense whether the dialed up frequency is above or below 10 MHz. Output of Q20 goes high for 10 MHz and above and turns on VCO4 through switch Q26 and turns off VCO3 through Q23, Q25. When the dialed in frequency is below 10 MHz VCO3 is switched on and VCO4 is switched off. This logic is controlled by Frequency Selector switches S1101, S1102.

1.26 The wide frequency range, 25 MHz, which VCO3 and VCO4 must cover requires an adjustment in loop gain of the phase lock loop circuitry. This is accomplished by changing the feedback resistance of the Loop Amplifier U5. Q31, Q32, Q33 are the switches that control the feedback resistance. R91 is switch in for 0-3.9999 MHz, R92 for 4-9.999 MHz and R160 for 10-25 MHz.

1.27 When VCO4 is on (10-25 MHz is in use) the output of Q37 goes high to remove the negative voltage from Q33 to turn it on, placing R160 in the U5 feedback loop. When VCO3 is in use the Frequency Selector switches, S1101, S1102, control the choice of R91, 0-3.9999 MHz or R92, 4-9.9999 MHz. This is accomplished through VCO Switching Circuit, CR10, CR11, Q21, Q22, NAND gate CR14, CR15, and switch circuit Q35, Q36, Q38, CR21. CR16, CR17, CR18 are isolating diodes. CR19 and CR20 give Q35 and Q36 switches additional noise immunity.

1.28 Output from either VCO goes to the Power Splitter, R140-142, C94, C95, T4, through WT3 to Loop A. The other output from the Power Splitter goes to Mixer Drive Q40 and to one input of the mixer T5, T6, CR22-25. The other input to the Mixer is the 50 MHz reference frequency from Reference/Divider, 3400. The 50 MHz is amplified by Q41, Q42, Q43 and applied to the Mixer through Impedance Matching Network L25, C106.

1.29 Mixer output, 2.3-27.3 MHz, goes to the divide-by-N circuit, 3200, through attenuator R147-R149 and low pass filter L23, L24, C107-C111 through J4, where it is divided down to 100 kHz and returns to the 3400 board through J7, pin 17. This 100 kHz signal is amplified by Q17 and applied to the Phase Detector U4. The other input to the phase detector is 100 kHz from the Reference Divider, 3400, through amplifier Q19. Phase Detector output is amplified by Loop Amplifier U5, the gain of which is controlled as discussed above. Also around U5 is a Latch Detector, Q30, Q34, to prevent the phase lock loop from latching up in an unlock mode of operation.

1.30 Loop Amplifier output passes through a 67 kHz LP Filter C67-69, L14-16, C70-73 to output buffer Q39 and through WT1 to Loop A as a steering voltage to VCO1, VCO2. The output of the filter also is fed back to the VCO3-4 Control line to the Varicap CR12, CR13 to complete the phase lock loop circuit.

Summing Loop A

1.31 This loop combines the output of Summing Loop C and Offset Loop B to provide the First L.O. output of 50,701.000 to 75,700.000 kHz adjustable in 10 Hz steps. Figure 3-15.

1.32 VCO1, Q15, CR7, L9 cover the range of 50,701.000 to 60,700.000 kHz for the Frequency settings of 0-9.9999 MHz. VCO2, Q14, CR6, L10 cover the range of 60,700.000 to 75,700.000 kHz for the Frequency settings of 10-25 MHz. Outputs are buffered by Q10, Q12, and the VCOs are enabled by switches Q11, Q13 which are controlled by VCO switching circuit CR8, CR9, Q18, in Figure 3-16 and described in paragraph 1.25.

1.33 The 50,701.000 to 75,700.000 kHz VCO1 and 2 output passes through the Directional Coupler, R41-43, C34, C36, T3, to the output buffer Q8, and through J2 to the First Mixer.

1.34 The second output of the Directional Coupler goes through Driver Amplifier Q9 to the Mixer T1, T2, CR2-5. The other input to the Mixer is the 52.3-77.3 MHz output of Loop B through the 20 dB Attenuator R32-34. The 1.6 MHz to 1.5 MHz Mixer output passes through the attenuator network R35-R37 to the 6.3 MHz Low Pass Filter, L5, L6, C10, C11, C15 to IF amplifier Q4, Q5, buffer Q6, to the Phase Detector U2.

1.35 The other input to the Phase Detector is the 1.6 MHz to 1.5 MHz output from Summing Loop C in the Low Frequency PLL circuit through buffer amplifier Q7. Output from the Phase Detector goes to the Loop Amplifier U1. U1 is protected from lock-up by Latch Detector Q2, Q3, and provides closed loop compensation with the RC feedback impedance, R12, C16. Output from U1 then goes through the active Low Pass Filter circuit of Q1 to provide the control voltage for VCO1 and 2. The Steering Voltage from Loop B is filtered by Low Pass Filter C5-7, C9, L3, L4 and combines with the VCO control voltage from Q1 to provide the full VCO1, VCO2 control. Thus the 50,701.000 to 75,700.000 kHz L.O. is referred to the Crystal Oscillator standard and made adjustable over its full 0-25 MHz range in 10 Hz steps.

Programmable Dividers. 3200

1.36 Three programmable dividers are used to cover the frequency range of the CE-70. The divide-by-P covers the tens and hundreds digits, divide-by-M covers the thousands and ten thousands digits and divide-by-N covers the hundred thousands, millions and ten millions digits. The purpose of each divider is to divide the output frequency of a mixer, where the VCO output has been mixed with a reference frequency, by a number, determined by the setting of the Front Panel Frequency dials, so that the divided

frequency output will be equal to a reference frequency. This output frequency, 1 kHz for P, 10 kHz for M and 100 kHz for N, is to be compared in a Phase Detector with a Reference of the same frequency in order to generate an error control voltage for the VCO to phase lock the VCO on frequency, and thus maintain a zero frequency error. In this way the VCO frequency is controlled by the Frequency dial settings, since the VCO frequency must change each time the dials are reset in order for the divided frequency to the phase detector to be exactly equal to the reference frequency to the phase detector.

Divide-by-P Divider

1.37 The VCO of the E Offset Loop, to which the P Divider is connected has a frequency range of 10.200 to 10.101 MHz, which when mixed with the 10 MHz Reference produces a frequency ranging from 200 to 101 kHz. This frequency is applied to the input of the P divider. It must always be divided by a number that will produce a 1 kHz output. See Block Diagram Figure 1-3.

1.38 Input to the P divider is through amplifier/buffer Q4, Q5, Q6 to the up-counters U11, U12, which are controlled by the 10 Hz and the 100 Hz Frequency dials, where the proper division takes place to provide the required 1 kHz output when the VCO frequency is correct.

1.39 If, for instance, the dialed up frequency were .25 MHz, the divider input frequency would have to be 200 kHz-25 kHz = 175 kHz. To produce a 1 kHz output the input must be divided by 175. To produce 200-25 = 175 a tens complement method is used. In this case the number 25 from the frequency dials is loaded into the up-counters U11, U12. See Figure 3-12. A load pulse is generated by U14. The counters then count up from 25 to 00 at the rate of the input frequency, and then start over. The J-K F/F U14-9 changes state at the 75th count from U11-U12 to produce an output pulse but no load pulse. The counters now count from 00 to 99 to 00 and generate a load pulse (at the 100 count) which loads 25 again and the cycle repeats. The total count for a cycle is then 75 +100 = 175. For each 175 count one output pulse is generated, thus dividing the input frequency by 175. When the VCO has shifted to the correct frequency due to the Phase Detector error voltage the loop is locked on frequency until the Frequency dials are changed.

Divide-by-M Divider

1.40 For the M divider the procedure is similar but with additional operations. The M divisor in this case is 498 minus the dialed in number, consisting of the thousands and ten thousands digits. 498 is divided into its parts 98 and 400. The tens complement of 98 is 902 which is loaded into the counters U17-U19 to obtain the tens complement out, or a count of 98.

1.41 The Load Pulser circuits of U15-4, 5, 6 and U16-1, 2, 3 and the Data Select circuit of U16-11, 13 combine to load "9" into U17, inhibit loading of U18 and allow "2" to be loaded into U19. The low in U15-2, 10, 13 inhibits input data through the Data Select circuits. When the counters reach the 999 state, the look ahead logic, U13, enables the Overflow Detector, U20. The detector changes state on the next count (overflow state of 1000) to generate another load pulse. This time 6 is loaded into U17 and the input data from the front panel Frequency Selector switches is loaded into U18, U19. The loaded number is 600 (tens complement of 400) plus the dialed frequency. The counter now counts to 1000 which results in the tens complement of the number, or 400 minus the dialed frequency. The total count is then 98 plus 400 minus the dialed frequency.

1.42 For example, the desired number M equals the fixed number Mf - 498, minus the variable number from the front panel, Mv. M = Mf - Mv. If the variable number is Mv = 13 (13 kHz), M = 498-13 = 485. The count as described above is 1000-902-98 plus 1000 - (600 + Mv) = 1000 - 613 = 387, so M is 98 + 387 = 485.

1.43 Input to the divider from Loop D mixer is through input amplifier Q1, Q2 and buffer Q3. U16-8, 9, 10 is a wave shaper-driver to provide logic level signals to the dividers. U16-4, 5, 6 is the output buffer.

Divide-by-N Divider

1.44 In the N divider the divisor N is equal to the fixed frequency, 23, plus the variable frequency, 0-259, set in by the Frequency dials. Thus the Mixer output of 2.3 MHz - 28.2 MHz from the B Offset loop is divided by any number 23 - 283 to provide the required 100 kHz output to the loop phase detector.

1.45 The setting of the 100 kHz, 1 MHz dials is loaded into the up-counters U7, U8 as a nines complement number. The 10 MHz dial is loaded into U9 as a threes complement number. Complementing of the Frequency dial settings is accomplished with the logic network of U1, U2, U4 and part of U5, U6.

1.46 When the counter is counted up to overflow (U9-12) the complemented numbers are re-complemented. The total count is then the variable frequency plus one. Nineteen additional counts are required by the look ahead logic, U3-1, 2, 3, 4, 5, 6, 12, 13 before triggering the pulse-stretcher, U10, for an additional 3 counts to provide loading time for the next count. Thus the total count is the dial frequency plus one plus nineteen plus 3 which produces the divisor, the dial frequency plus 23. The output through buffers U6-3, 4, 10, 11 will then be 100 kHz as long as the input frequency from the B offset loop is correct.

1.47 Output from the B offset loop enters through J1, is amplified by Q7-Q9 and buffered by U5-1, 2, 12, 13 to provide the logic level clock signal to the up-counter logic.

TCXO/Reference Divider. 3100

1.48 This circuit provides all the precision reference frequencies used in the instrument. See Figure 3-11. The source of these frequencies is the very stable 10 MHz Temperature Controlled Crystal Oscillator, TCXO. For maximum stability of this oscillator the power to the oscillator is regulated by Q5, U9. The +5V supply to the integrated circuits is regulated by U13.

1.49 Output signals from the circuit are both sine wave and logic level. 10 MHz sine wave from the TCXO goes through Time Base Selector Driver, U11, to three 10 MHz buffer amplifiers. Buffer amplifier Q2 is coupled to TTL Driver Q1 through T1 to provide a logic level signal to drive the divider chain U1-U5. CR1 sets the bias on the base of Q1. U1, divide-by-2, U2, divide-by-5 and U3, divide-by-10 provide a 100 kHz reference output through buffer U6-1, 2, 3 to the 3400 and 3500 circuit boards. U4, divide-by-10 provides a 10 kHz reference output through buffer U8-4, 5, 6 to Loop D on the Low Frequency Phase Lock Loop board, 3300. The 10 kHz output also goes through buffer U7 to U5, divide-by-10, to produce a 1 kHz reference output through U8-8, 9, 10 to Loop E on the 3400 board.

1.50 The output of another buffer, Q8, is coupled through T3 to a times 5 multiplier, Q10-Q12, Q15, Q16, to provide a low level 50 MHz output to the 50.7 MHz Phase Lock Loop on the ALC/Attenuator/Mixer board 3500. This output is also amplified through Q13, Q14 to provide a high level 50 MHz output to Phase Lock Loop B on the 3400 board. The 10 MHz output of a third buffer, Q9, is coupled out through T4 and J2 to Phase Lock Loop D on the 3300 board.

1.51 The source of the Reference Divider frequencies is the TCXO on this board, whenever the INT/EXT switch is in the INT position. If a CE-71 is used with the CE-70 and CE-72 the internal TCXO is used when the CE-72 INT/EXT switch is in INT and the CE-71 MAN/SWP switch is in the MAN position. At all other settings of these switches the 10 MHz must be supplied from the CE-70.

1.52 INT/EXT Time Base Selector, U10, is controlled by the INT/EXT, MAN/SWP switches. Output at U10-3 controls the Internal TCXO Power Switch, Q3, Q4 and the Time Base Selector Driver, U11. Output at U10-11 controls the Switch Driver, Q6, Q7 which in turn controls the External 10 MHz RF switch, CR2 - CR5 which controls the external 10 MHz to the board. When used, the external 10 MHz signal passes through the switch CR2-CR5 to the Buffer/TTL Driver, U12, and from there to the Time Base Selector Driver, U11-8, 10 and then into the regular channels described above.

Frequency and Level Display. 1100

1.53 This circuit contains the front panel frequency selector switches, Figure 3-3, and the display circuits for both frequency and level, Figure 3-2. The switches are BCD encoded, and they are connected to control logic gates on the Display Multiplexer board, 2200, to control the LED frequency display. They are also connected to the Programmable Divider circuit, 3200, to control the frequency synthesizer. Outputs from the 10 MHz and 1 MHz switches also go to the Flash Display logic on the Display Multiplexer, 2200.

1.54 The output from the Display Multiplexer is applied to the LED anodes in sequential order through transistor drivers, Q1-Q18. The seven segments are controlled from the Display Multiplexer circuit through the transistors Q19-Q25 which connect the cathodes of both the Frequency and Level display LEDs to ground as required. All the corresponding segments are connected in parallel and each set is controlled by a single transistor driver. Selection is accomplished by energizing the common anodes in proper order for the display of the correct figure on each. Each display is turned on approximately 180 times per second so the display appears to be continuous to the eye of the observer. Supply voltage to the integrated circuits is regulated on the board by the +5V regulator, U1.

Display Multiplexer. 2200

1.55 Both the Frequency Selector switches and the output Level control switches are connected to the Display Multiplexer logic circuits to control the display readout, and, in the case of the Level switches, to the attenuator relay logic to control the output level. See Figures 3-7 and 3-8.

1.56 The Frequency Selector switches are binary coded and each is connected to a set of four AND gates, U3-U9, on this board. The outputs of each set of four AND gates, including the two sets of AND gates, U14, U15, controlled by the LEVEL switches, are connected in parallel through inverters, U2, to the seven-segment decoder, U1. The seven outputs from U1 control the seven LED Display Cathode switches, U1119-Q1125 on the Frequency and Level Display board. The corresponding segments of each LED Display are connected to a cathode switch. Thus each corresponding segment in all the LED displays is connected to ground whenever a cathode transistor switch is turned on. In order to provide a readable display, the anodes of each Display LED and each set of input AND gates corresponding to that Display LED is sequentially sampled. Sampling takes place at approximately a 1800 Hz rate so each of the nine Display LEDs come on approximately 180 times per second.

1.57 The clock frequency repetition rate of approximately 1800 Hz is generated by the multivibrator, U13. The clock drives the Decade counter, U12, which provides a BCD output to drive the BCD-to-Decimal Decoder/Driver, U11. The output of U11 is a sequential ten step, active low series of pulses. These pulses through the inverters, U10 and part of U2 and U17, enable each switch-controlled set of AND gates, U4-U9, U14,

U15, in sequence. These pulses also enable the transistor anode switches for each Display LED in the same sequence. When a particular set of AND gates is enabled, the BCD number to which the switch is set is transmitted to the 7-segment decoder driver, which turns on the proper cathode transistor switch, Q1119-Q1125, to form the correct figure in the Display LED. Since each LED is turned on approximately 180 times per second the display seems continuous to the eye.

1.58 To prevent setting the Signal Generator to a frequency above the maximum range this condition is sensed, and when it occurs, the display is caused to flash. The B, C, D connections to the 1 MHz switch dial and the B connection of the 10 MHz dial are connected to the logic U18, U17-1, 2, U19-3, 4, 12, 13. If these two dials are set for 26 MHz or above the Flash Display Oscillator, U20, is enabled. U20 is a Multivibrator adjusted for a repetition rate of about 45 times per minute. Output from U20 goes directly to U19-10, 11, U21-11, 13, U22-8, 9, 10, 11, 12, 13 to flash the plus or minus sign if it is being used. Output also goes through U18-11, 12, U19-1, 2 to the blanking input of U1 to flash the display.

1.59 The conditions in which the Frequency Display and the Level Display are on, blanked or flashing are given in the Truth Table in Figure 1-4. This is accomplished by the logic circuits of U16, U18-11, 12, 13, U19-1, 2, 8, 9, 10, 11, U21-1, 2, 3, 4, 5, 6, 11, 12, 13, U22-8, 9, 10, 11, 12, 13, which also blank the ± sign. The ± sign is also blanked when the Level reading is 0 dBm. The Flash Display Oscillator is turned off through Q1 whenever the Display is blanked by the INT/EXT or the CE-71 SWEEP switch. Leading zero is blanked in all switch positions for ± 0 to 9 through the logic of U17-3, 4, 8, 9, U21-8, 9, 10, U22-1, 2, 3, 4, 5, 6, U23-11, 12, 13, Q11, Q12, and the enabling pulse to the Decade Level AND gate from U17-10. The zero blanking pulse from U21-8 is applied to the Seven Segment Decoder, U1-5.

1.60 One set of wafers on the Units and Decades Attenuator switches, Figures 3-1 and 3-8, controls the Display readout and the other set controls the Attenuator relay switches. Switch contacts controlling transistor switches Q3-Q10 and logic U15-8, 9, 10, U23-8, 9, 10 operate the relays. Q2 operates to cut in the 30 dB attenuator through Q3 whenever the OUTPUT switch is placed in the OFF position. This prevents any residual noise being picked up by the CE-70 through the external connection from the CE-72 output amplifier.

1.61 The other set of attenuator wafers controls the NAND gates to the Seven Segment Decoder to set up the proper readout for the attenuation level selected. CR3-CR10 are isolation diodes to prevent unwanted DC feedback in the switch connections. U17-5, 6, U23-1, 2, 3, 4, 5, 6 are part of the leading zero blanking logic.

Units and Decades Attenuators. 3800, 3900

1.62 These units, which control the output level from the Power Amplifier, 3700, are very similar to each other, the major difference being in the dB per step range. Each attenuator is a resistive pi network. The networks are switched in series with each other as required by RF relays which are controlled by the LEVEL switches. Each relay is protected from reactive pulses from the coils by diodes and RF-isolated by chokes and feed-through capacitors, and are enclosed in a double shielded assembly.

ALC Attenuator/Mixer. 3500

1.63 In this circuit a Local Oscillator frequency of 50.7 MHz is generated in a Phase Lock Loop and mixed with the variable 50.7-75.7 MHz frequency from either the local synthesizer or the CE-70 synthesizer to produce the required output of 1 kHz-25 MHz. In addition a PIN diode controlled from the Power Amplifier/Detector board, 3700, provides automatic levelling, a switch controlled by the Front Panel OUTPUT ON/OFF switch controls the output Preamplifier and two switches controlled by the INT/EXT front panel switch or the CE-71 MAN/SWP switch control the source of the input 50.7-75.7 MHz frequency. Refer to Block Diagram Figure 1-2.

1.64 50.7-75.7 MHz input to this circuit is selected either by the INT/EXT switch on the CE-72 front panel or the setting of the MAN/SWP switch on the CE-71. The INT/EXT/SWEPT input switches, CR6-CR9, CR10-CR13, which control the 50.7-75.7 MHz input are operated by the INT/EXT Switch Driver, Q21-Q24. See Figure 3-18. The polarity of the outputs of the driver are such that when one switch is on the other is off. This 50.7-75.7 MHz input is then amplified in the L.O. Driver, Q15-Q17 and applied to the Mixer, BM1.

1.65 The other input to this mixer is the locally generated 50.7 MHz L.O. frequency. This frequency is generated by VCO, Q8, CR1, L6, which is controlled by a phase lock loop circuit. See Figure 3-17. Each of two outputs from the VCO is separately buffered, one by Q9 and the other by Q10. Output from Q10 goes to the Phase Lock Loop Mixer T1, T2, CR2-CR5.

1.66 The other input to this mixer is 50 MHz from the Reference Divider, 3100, through J4 and the 50 MHz Driver, Q2, Q3. 700 kHz output from the Mixer is amplified by U6, converted to a logic level signal by TTL Driver, Q11, Q12 and divided by seven to produce a 100 kHz output by U3, U4. This 100 kHz signal and the 100 kHz reference signal from the Reference Divider, 3100, are both applied to the Phase Detector, U2, to generate the error voltage. The error voltage is amplified by the Loop Amplifier, U5.

1.67 The amplified output of U5 is passed through a Twin Tee 100 kHz filter, R22, R23, R25, C18-C20 and through a 50 kHz Low Pass active filter, Q6, Q7, to remove unwanted AC components. The DC error voltage is then applied to the Varactor diode, CR1, to control the VCO output frequency.

1.68 The other VCO output through Q9 passes through the PIN diode attenuator, CR14, through a 50.7 MHz buffer, Q25, a 54 MHz Low Pass Filter, C89, C91, C92, L19, a 9 dB pad R118-R120 to the mixer, BM1. See Figure 3-18. Mixer 1 kHz - 25 MHz output passes through a 3 dB matching pad R82-R84, a 30 MHz Low Pass Filter, C71-C77, L15, L16, to a 33 dB preamplifier, U7, Q18-Q20, Q26, Q27 and out to the Power Amplifier Detector, 3700, through J3. The 33 dB preamplifier is turned on or off by the front panel OUTPUT ON/OFF switch through the Preamplifier Power switch, Q13, Q14, which controls the power to the amplifier, thus controlling the output.

Power Amplifier/Detector. 3700

1.69 Output from the ALC Attenuator/Mixer comes into this board through J1, see Figure 3-19, and is amplified by the power amplifier. U1 is connected and compensated as a very low frequency or DC amplifier. The signal is AC coupled to the complementary amplifiers, Q1-Q3 and Q4-Q6. The output is then DC coupled to Q7, Q8 and Q9, Q10. The DC level at the output is maintained constant by feedback through R14. CR2-CR9 provide temperature compensation which is adjusted by Bias 1 and Bias 2 controls. R2 adjusts the DC balance. This amplifier has a bandwidth in excess of 25 MHz. C24 provides the residual frequency response adjustment.

1.70 Power Amplifier output at 1 kHz to 25 MHz passes through J2 to the attenuators, Impedance Select circuits and to the output jack. The output also goes to the delay line through J4. The purpose of the delay line is to provide a circuit with losses and a frequency response similar to that of the attenuators. The delay line output comes back in through J3, see Figure 3-20, through the frequency compensation and matching network R47, C42, C43. The ALC Detector CR1, R68, C47-C49 drives the ALC Loop amplifier U5, which controls the PIN diode attenuator CR3514 on the ALC Attenuator/Mixer board. The effect of sampling the output level at the output of the delay line is the same as though the signal were sampled at the output of the attenuators so that the effect is to level the attenuator output.

1.71 Q24, Q25 switch the capacitors C50, C52 in or out to adjust the bandwidth of the ALC Loop Amplifier, Figure 3-20. In the MANUAL position of the MAN/SWP switch on the CE-71 (or when no cable is connected to J4002, FC, or when a cable is connected from J4002 to the CE-70) the two capacitors are switched in to provide a very narrow bandwidth to the ALC circuit. Minimum distortion on the sine wave output of the Signal Generator requires this very narrow ALC circuit bandwidth. In the SWEEP mode of the CE-72 a wide bandwidth to provide rapid levelling is required. In this mode C50 and C52 are switched out to provide this wide bandwidth.

1.72 Level adjustment to relate the output level to the meter indication and to provide the compensation necessary for the different output impedances of the Generator is summed with the ALC to the input of the ALC Loop Amplifier, U5.

1.73 Output level is referenced to the stable voltage determined by the Zener diode, CR12, which is connected to the non-inverting input of the Voltage Follower, U2. The Voltage Follower output reference voltage, 6.2V, is connected through R74 to the FINE control, R1001, and then through filter, R75, C57, to the non-inverting input of U4 and to the drains of Q18-Q21. The Voltage Follower reference output is also connected to the zero dB adjusting network, R84, R85, R87.

1.74 The meter is calibrated by selecting 75Ω and connecting a properly terminated power meter to the output. The FINE control is set for 0 dBm on the power meter and R85 adjusted for a CE-72 meter reading of zero. FINE is then adjusted for +1 dBm and R88 adjusted for a CE-72 meter reading of +1 dBm, which establishes the meter range. A properly terminated power meter is then connected to the selected impedance output and the selected adjustment control, R57, for 124/150Ω, R58 for 135Ω and R59 for 600Ω, adjusted for the correct CE-72 meter reading. In order to turn off the meter the switch Q22, Q23 turns off the +15V supply to the Meter Amplifier when the OUTPUT ON/OFF switch is in the OFF position.

Impedance Selector. 1200

1.75 S1A-D are Front Panel pushbutton Impedance Selector switches, mechanically coupled so that only one is on at a time. Each switch connects the output bus from the Attenuators to the selected output jack through the impedance transformers for all but the 75Ω output which is connected through a matching inductor. The 600Ω transformer is mounted external to the Impedance Selector assembly. In addition, these switches control the transistor Impedance Loss Level Compensation transistor switches Q3714-Q3721 which switch in the proper compensation for the selected output.

Power Supply. 2300

1.76 The power supply employs three bridge rectifiers made up of discrete diodes, CR1-CR4, CR7-CR10 and CR12-CR15. The rectifier outputs are regulated using linear IC regulators. See Figure 3-9.

1.77 The +15V and -15V supplies must be very stable so two steps of regulation are employed. U1 and U4 are 18V regulators, followed by U2 and U5 which are 15V regulators which provide the +15 and -15V supplies. The same rectifier that supplies the +15V output is also used for U3 which

provides the +12V supply in only one regulating step.

1.78 The output of the rectifier CR12-CR15 is connected to two 8V regulators, U6, U7, for the required 8V supplies. From these supplies the on board 5V regulators provide the +5V required by the board ICs. Each of the six supplies is protected against reverse voltage by a diode across the output.

1.79 The +15V rectifiers are supplied from two 20V AC secondary windings of the Power Transformer, T4001, mounted on the Rear Panel, Figure 3-23. The +8V rectifiers are supplied from a 13V AC winding on this same transformer.

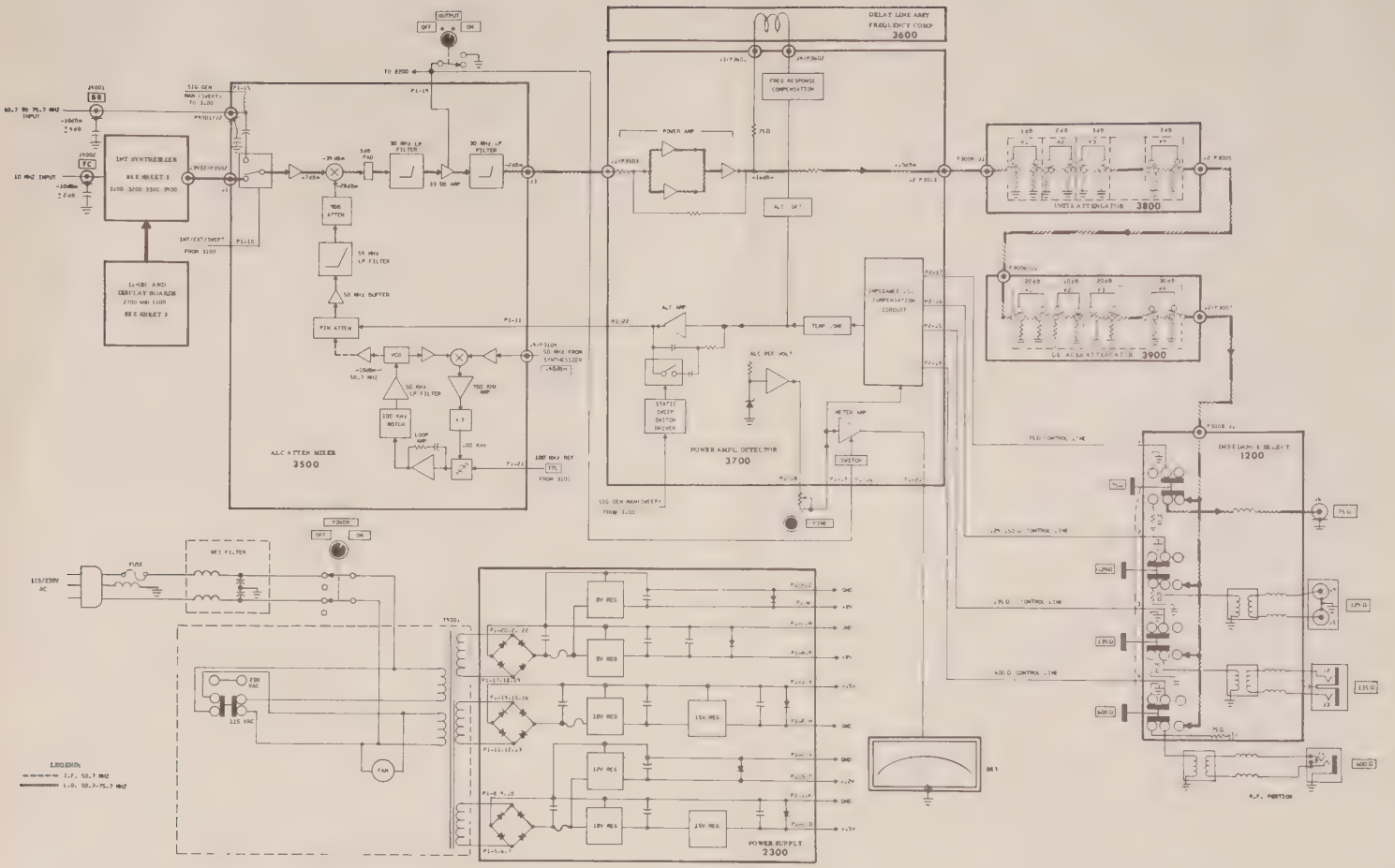


Figure 1-2. CE-72 Signal Generator Block Diagram, sheet 1

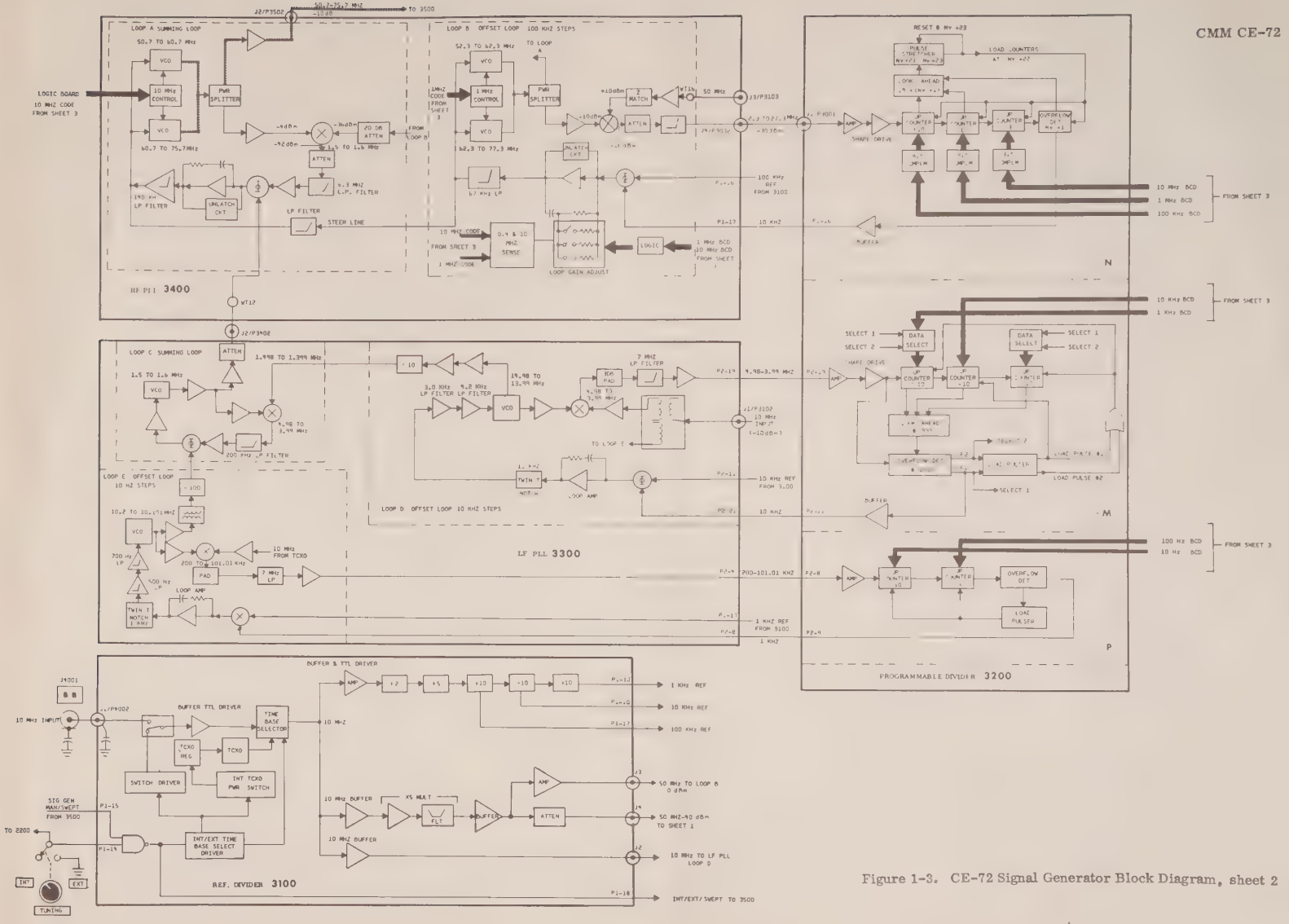


Figure 1-3. CE-72 Signal Generator Block Diagram, sheet 2

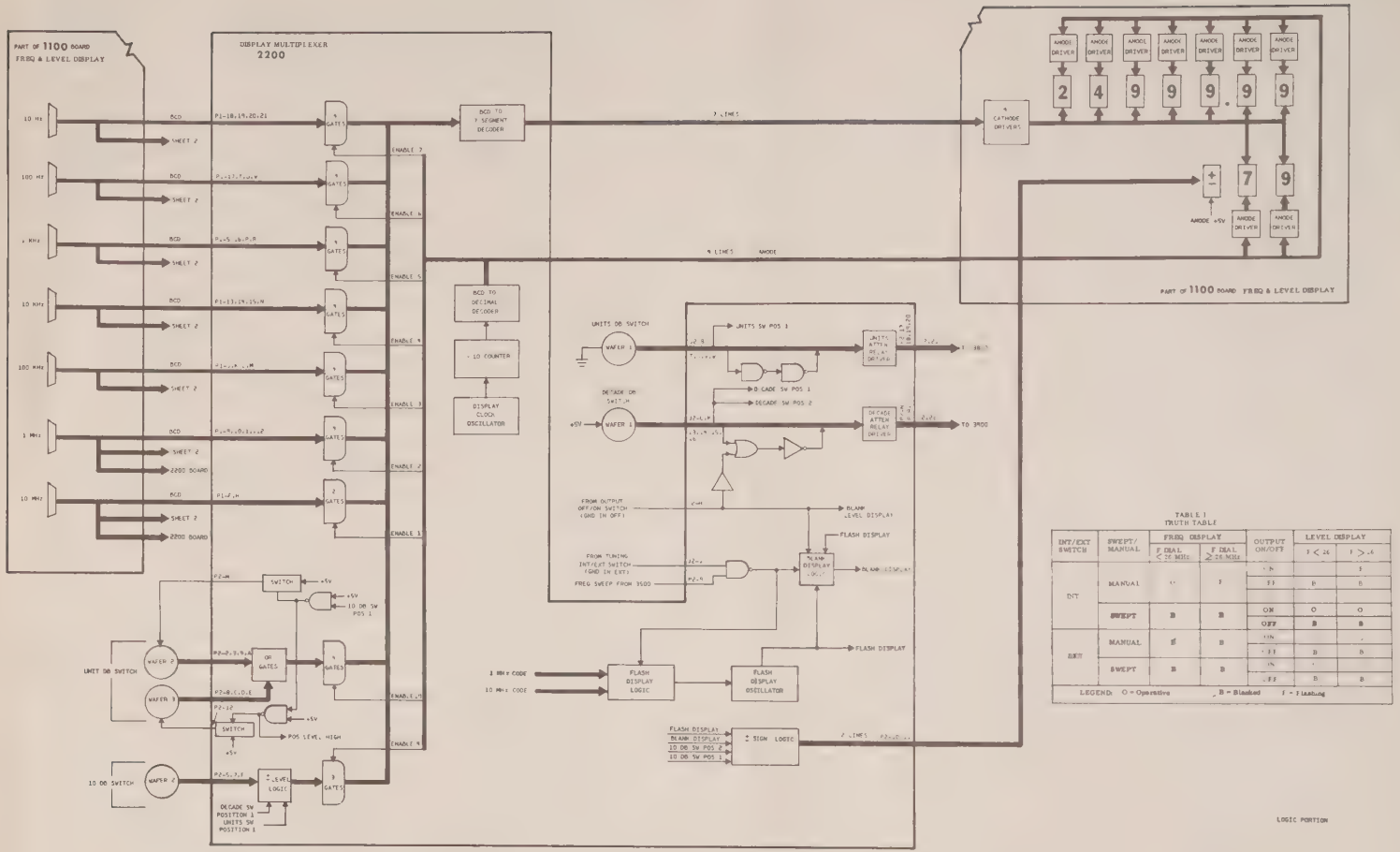


TABLE 1
TRUTH TABLE

INT/EXT SWITCH	SWEEP/ MANUAL	FREQ DISPLAY		OUTPUT ON/OFF	LEVEL DISPLAY	
		F DIAL < 26 MHz	F DIAL ≥ 26 MHz		F < 26	F > 26
INT	MANUAL	F	F	ON	F	F
				OFF	B	B
	SWEPT	B	B	ON	O	O
				OFF	B	B
EXT	MANUAL	F	B	ON	F	B
				OFF	B	B
	SWEPT	B	B	ON	O	B
				OFF	B	B

LEGEND: O = Operative B = Blanked F = Flashing

Figure 1-4. CE-72 Signal Generator Block Diagram, sheet 3

SECTION 2
MAINTENANCE

GENERAL

2.01 This section of the manual contains the information necessary to check the performance of the CE-72 and to make the recommended field adjustment.

2.02 Since the CE-72 contains some rather complicated, high precision circuits which require special equipment which has been specially calibrated for alignment and adjustment and special procedures in making these adjustments, it is recommended that the instrument be returned to the factory for recalibration or repair. Please contact the Cushman Electronics, Inc. Customer Service Department for further instructions before returning an instrument.

PERFORMANCE CHECK

Test Equipment Required

2.03 Any equivalent instrument may be used in place of the following listed equipment if necessary.

Frequency Selective Levelmeter	CE-70
Milliwatt Test Set	W&G EMP-1 (#1)
Test Probe	W&G TK-10
Test Probe	W&G (124Ω)
Test Probe	W&G (150Ω)
Milliwatt Power Meter	STC GTA-95 (#2)
135Ω Plug-in Module	STC
600Ω Plug-in Module	STC
Counter	HP 5243
Directional Bridge	HP 8721A Opt. 008
2 Minimum Loss Pads 50:75Ω	Texscan 2M57
Spectrum Analyzer	HP 141T, 8552B, 8553B
Tracking Generator	HP 8443A
Frequency Standard 1 MHz	HP 105A
Precision Attenuator	Daven 8500-L4-75-120-1-2

Output Frequency Check

2.04 Turn on the CE-72 and let it warm up for at least 4 hours.

2.05 Set the CE-72 controls:

INT/EXT	INT
Output OFF/ON	ON
Impedance Ω	75
Level	0 dBm

2.06 Connect counter to 75Ω connector on the front panel.

2.07 Set the CE-72 to the following frequencies and verify counter readings:

CE-72 Freq. kHz	Counter kHz	Spec
00001.00	0001.0000	± .1 Hz
01000.00	1000.0000	± .1 Hz
10000.00	10000.000	± 1 Hz
25000.00	25000.000	± 2 Hz

Output Meter Check

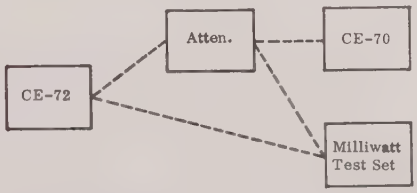
2.08 Set the CE-72 frequency to 1000.00 kHz. Adjust FINE control until output meter reads 0 dBm ± .005 dB. Connect Milliwatt Test Set (#1) using the TK-10 probe to the 75Ω output jack on the CE-72. Perform Milliwatt Test Set calibration procedure.

2.09 Record the Milliwatt Test Set reading for 0 dB. Set the CE-72 meter successively to -1.0, -0.5, +0.5, +1.0 dBm ± .005 dB, and record Milliwatt Test Set "reading" for each "setting".

2.10 Change the sign of each "reading" to obtain the "correction factor". Algebraically add the "correction factor" to the "setting" to obtain the "result". For example, if at a "setting" of -0.5 the "reading" were -0.49, the correction factor would be +0.49. The "result" would then be -.01. In each case the "result" must be within ± 0.02 dB of the "setting".

Absolute Accuracy, Internal Mode

2.11 Set up equipment as shown below:



CE-72 settings:

INT/EXT	INT
LEVEL	0 dBm
IMPEDANCE	75Ω
FREQUENCY	25000 kHz

CE -70 settings:

TONE/NOISE	TONE
LEVEL	-50 dBm
BANDWIDTH	75 Hz
METER	EXP
IMPEDANCE	75Ω
FREQUENCY	25000 kHz

2.12 Set the CE-72 output to 0 dBm ± 0.01 dB and secure dial with tape so it cannot be moved. Connect the Milliwatt Test Set to the CE-72 output and measure the level at 1 kHz, 10 kHz, 60 kHz, 650 kHz, 3.2 MHz, 5 MHz, 11.5 MHz, 18.6 MHz, 25 MHz. Record readings.

2.13 Disconnect Milliwatt Test Set from CE-72 and connect to output of Precision Attenuator. Connect input of precision attenuator to the output of the CE-72.

2.14 Set the attenuator for 10 dB attenuation and set CE-72 to +10 dBm. Decrease the attenuation in 1 dB steps and at the same time decrease the CE-72 output in 1 dB steps and record the plus or minus deviation of the Milliwatt Test Set reading from 0 dBm. Make this check for each of the frequencies listed in paragraph 2.12 and record deviation of readings from 0 dBm.

2.15 Disconnect the Milliwatt Test Set from the output of the precision attenuator and connect the CE-70 in its place. Set the attenuator for 50 dB attenuation and set the CE-70 to -50 dBm.

2.16 For each series of measurements at each frequency start by setting the CE-70 meter to the 0 dB reading recorded in paragraph 2.12 by using the CE-70 CAL control. (This eliminates ranging error in the CE-70).

2.17 Decrease the CE-72 level in ten dB steps from 0 dBm to -50 dBm and at the same time decrease the attenuation of the attenuator in 10 dB steps from 50 dB to 0 dB. For each step record the deviation of the CE-70 Level reading from -50 dBm. Repeat paragraphs 2.16 and 2.17 for each frequency listed in paragraph 2.12.

2.18 Leave the CE-72 output set for -50 dBm. Set the precision attenuator for 29 dB attenuation. Set the CE-70 to -79 dBm. Use the CE-70 CAL control to set the CE-70 meter to the same reading as was recorded for -50 dBm for each frequency.

2.19 Decrease the CE-72 Level in 10 dB steps to -70 dBm and then to -79 dBm and at the same time reduce the attenuation of the attenuator in 10 dB steps to 9 dB and then to 0 dB. Repeat paragraphs 2.18 and 2.19 for each frequency listed in paragraph 2.12.

2.20 Absolute accuracy should be within the following specifications:

10 kHz to 18.6 MHz	0 dBm	± 0.10 dB
	+1 to +10 dBm	± 0.15 dB
	-79 to 0 dBm	± 0.20 dB
18.6 MHz to 25 MHz	-79 to +10 dBm	± 0.25 dB
1 kHz to 10 kHz	-60 to +10 dBm	± 0.20 dB
	-79 to -61 dBm	± 0.40 dB

124Ω Output Accuracy

2.21 Set the CE-72 as follows:

FREQUENCY	60 kHz
LEVEL	0 dBm
IMPEDANCE	124Ω

2.22 Connect the 124Ω Test Probe to the Milliwatt Test Set (#1) and perform the Test Set calibration procedure. Adjust the CE-72 output for 0 dBm ± 0.01 dB and connect the Milliwatt Test Set to the output of the CE-72.

2.23 Check and record the output level at 60 kHz, 100 kHz, 300 kHz, 1 MHz, 2 MHz, 3 MHz, 5 MHz, 10 MHz, 11.5 MHz. Level should read 0 dBm ± 0.2 dB.

135Ω Output Accuracy

2.24 Set the CE-72 as follows:

FREQUENCY	10 kHz
LEVEL	0 dBm
IMPEDANCE	135Ω

2.25 Place the 135Ω plug-in module in the Milliwatt Power Meter (#2) and perform calibration procedure. Adjust the CE-72 output for 0 dBm ± 0.01 dB and connect the Milliwatt Power Meter to the output of the CE-72 with a short cable.

2.26 Check and record the output level at 10 kHz, 30 kHz, 60 kHz, 100 kHz, 300 kHz, 1 MHz, 2 MHz, 3.2 MHz. Level should read 0 dBm ± 0.2 dB.

150Ω Output Accuracy (Optional)

2.27 Set the CE-72 as follows:

FREQUENCY	10 kHz
LEVEL	0 dBm
IMPEDANCE	150Ω

2.28 Connect the 150Ω Test Probe to the Milliwatt Test Set (#1) and perform the calibration procedure. Adjust the CE-72 output to 0 dBm and connect the Milliwatt Test Set to the output of the CE-72.

2.29 Check and record the output level at 10 kHz, 30 kHz, 60 kHz, 100 kHz, 300 kHz, 1 MHz, 2 MHz, 3.2 MHz, 5 MHz. Level should read 0 dBm ± 0.25 dB.

600Ω Output Accuracy

2.30 Set the CE-72 as follows:

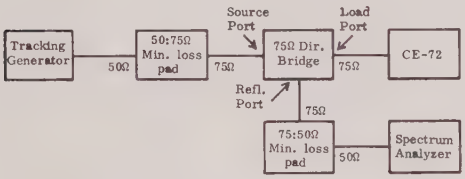
FREQUENCY	1 kHz
LEVEL	0 dBm
IMPEDANCE	600Ω

2.31 Place the 600Ω plug-in module in the Milliwatt Power Meter (#2) and perform the calibration procedure. Adjust the CE-72 output to 0 dBm ± 0.01 dB and connect the Milliwatt Power Meter to the output of the CE-72 with a short cable.

2.32 Check and record the output level at 1 kHz, 3 kHz, 5 kHz, 10 kHz, 30 kHz, 50 kHz, 100 kHz, 200 kHz, 500 kHz, 650 kHz. Level should read 0 dBm ± 0.2 dB.

Return Loss, 75Ω

2.33 Make the Return Loss setup as shown below:



2.34 Set the instrument controls as follows:

Tracking Generator

FUNCTION	Tracking Analyzer
MODE	Marker
RESOLUTION	10 Hz
RF OUTPUT LEVEL	-10 dBm

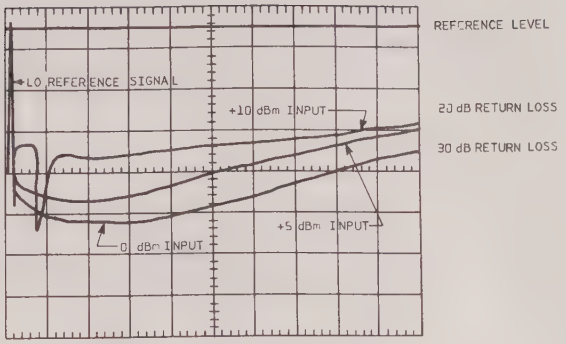
Spectrum Analyzer

INPUT ATTENUATION	10 dB
SCAN WIDTH	5 MHz/DIV
BANDWIDTH	30 kHz
LOG REF LEVEL	-30 dBm
SCAN TIME/DIV	10 msec
10 dB/2 dB/LINEAR	10 dB/DIV
CNTR FREQUENCY	25 MHz

2.35 Disconnect the CE-72 from the Directional Bridge Load port and leave bridge unterminated. Set the spectrum analyzer trace to the top reference line.

2.36 Terminate the Directional Bridge Load port with 75Ω. The trace on the spectrum analyzer should drop below the -40 dB graticule line between 1 MHz and 25 MHz. Remove termination.

2.37 Connect the CE-72 output to the Load port of the Directional Bridge and set the frequency to 1,000 kHz, Level to 0 dBm and Impedance to 75Ω. The return loss up to 25 MHz should be greater than 30 dB. See typical display shown below:



Typical Display

2.38 Increase the CE-72 output level to +5 dBm. The return loss up to 25 MHz should be greater than 25 dB.

2.39 Increase the CE-72 output level to +10 dBm. The return loss to 25 MHz should be greater than 20 dB nominally.

Harmonic Distortion Check

2.40 Connect the CE-72 75Ω output to the input of the spectrum analyzer. Set the CE-72 level to 0 dBm. Set the spectrum analyzer controls as follows:

ATTENUATOR	30 dB
2 dB/10 dB/LOG	10 dB/DIV
LOG REF LEVEL	0 dBm
SWEEP TIME	20ms/DIV

2.41 Set the CE-72 and the spectrum analyzer to the following frequencies. At each frequency the second and third harmonics should be more than 40 dB below the fundamental.

CE-72	Spectrum Analyzer Settings		
Freq	Center Freq.	Scan Width	Bandwidth
100 kHz	200 kHz	100 kHz/DIV	3 kHz
1 MHz	2 MHz	1 MHz/DIV	10 kHz
10 MHz	20 MHz	5 MHz/DIV	30 kHz
25 MHz	50 MHz	10 MHz/DIV	30 kHz

ADJUSTMENT

Time Base Adjustment

2.42 **Set the counter rear panel EXT/INT control to the EXT position. Connect the 1 MHz frequency standard output to the EXT BNC connector on the counter rear panel. (If the frequency standard has been properly calibrated with standard frequency and Time Station WWV the counter accuracy will be better than 10^{-8} PPM).**

2.43 Set the CE-72 Frequency to 25000.00 kHz, the Level to 0 dBm and connect the counter to the CE-72 75Ω output.

2.44 Adjust the TCXO ADJ control, see Figure 3-10, for a frequency of 25000.000 kHz ± 1 Hz.

TROUBLESHOOTING

Table 2-1. Troubleshooting Chart

Trouble Indication	Possible Cause
1. No LED display and no output	a. Instrument not plugged into AC outlet.
	b. Line fuse open.
	c. AC switch off or faulty.
	d. Faulty power supply.
	e. INT/EXT switch in EXT position and output ON/OFF switch in OFF position.
2. No Frequency LED display, Level LED display OK	a. INT/EXT switch at EXT position.
	b. Faulty 2200 board.
3. No Level LED display	a. Output ON/OFF switch OFF.
	b. Faulty 2200 board.
4. No LED display, output OK	a. Faulty 1100 or 2200 board.
	b. Power supply cable to 1100 board loose or disconnected.
5. Display and output OK, no meter reading	a. Connection from 3700 board to meter terminals loose or disconnected.
	b. Faulty meter amplifier 3700 board.
6. Display OK, meter reads OK, no output	a. Output ON/OFF switch OFF.
	b. Faulty power amplifier 3700 board.
	c. Preamplifier 3500 board.
	d. Impedance selector switch at wrong impedance setting.
7. Output at 75Ω but not at 124Ω/135Ω/150Ω/600Ω	a. Faulty impedance selector switch.
	b. Faulty 124/135/150/600Ω impedance transformer.
8. Display OK but does not flash at 26 MHz	a. Faulty switch (1000 Hz or MHz switch).
	b. Faulty 2200 board.
9. LED only displays segments	a. Faulty 2200 board.
	b. Faulty 1100 board.
10. No display on any LED	a. Faulty LED.
	b. Faulty corresponding anode driver on 1100 board.
11. Level display shows 00 when dialed up for 0 dBm	a. Faulty 2200 board leading zero suppression circuit.

Table 2-1. Troubleshooting Chart (cont)

Trouble Indication	Possible Cause
12. No "+" sign when dialed up for level above 0 dBm	a. Faulty 2200 board.
13. No "-" sign when dialed up for level below 0 dBm	a. Faulty 2200 board.
14. Incorrect level LED display	a. Faulty level switch. b. Faulty 2200 board.
15. FINE control does not give +1 dB to -1 dB swing on meter	a. Faulty FINE pot. b. Faulty 3700 board meter amplifier circuit.

SECTION 3
PARTS LISTS AND SCHEMATIC DIAGRAMS

INTRODUCTION

3.01 The following parts lists and schematic diagrams have been arranged in order according to the Circuit Reference Series numbers. Refer to paragraphs 1.02-1.05. Each schematic diagram and parts list is identified with this number. The circuit boards in the instrument are marked with an identifying Assembly Number. The PC Board number is etched on the board. See Cross Reference Table 3-1 below.

3.02 Parts list pages are grouped with the schematic diagrams to which they refer. Component identification drawings showing the location of the individual components on the circuit board are placed on the inner sheet of the schematic diagram to which they apply.

Table 3-1. Printed Circuit Board and Circuit Reference Series Cross Reference

Ckt. Bd. No.	Circuit Title	Ckt. Ref. No.	Assembly No.	Figure No.	Page No.
1780-0541	High Frequency Phase Lock Loop	3400	7001-0411	3-15, 3-16	3-73, 3-75
1780-0543	Low Frequency Phase Lock Loop	3300	7001-0292	3-13, 3-14	3-59, 3-61
1780-0544	Programmable Dividers	3200	7001-0293	3-12	3-49
1780-0558	Power Supply	2300	7001-0408	3-9	3-33
1780-0560	Decades Attenuator	3900	7001-0414	3-22	3-105
1780-0561	Units Attenuator	3800	7001-0413	3-21	3-101
1780-0583	Power Amplifier/Detector	3700	7001-0412	3-19, 3-20	3-95, 3-97
1780-0587	TCXO/Reference Divider	3100	7001-0410	3-11	3-43
1780-0589	Display Multiplexer	2200	7001-0405	3-7, 3-8	3-27, 3-29
1780-0590	Frequency and Level Display	1100	7001-0407	3-2, 3-3	3-9, 3-11
1780-0592	Impedance Selector	1200	7001-0406	3-4	3-15
1780-0593	Main Chassis Mother Board	2100	7001-0404	3-6	3-21
1780-0598	ALC Attenuator/Mixer	3500	7001-0409	3-17, 3-18	3-85, 3-87
	Delay Line	3600	7041-0019	3-10	3-35
	Front Panel	1000	7003-0114	3-1	3-3
	Main Chassis Interconnection	2000		3-5	3-19
	Main Chassis, Interconnection	3000		3-10	3-35
	Rear Panel	4000	7003-0115	3-23	3-109

FRONT PANEL ASSEMBLY, 1000

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
1000	PNL Assy, Front	7003-0114	Cushman	
J1	Jack, Ring Tip Sleeve Open Circuit	2586-0012	Switchcraft	12B
J2	Jk, 2 Cond Open Ckt Audio	2586-0019	Switchcraft	31
J3	Jk, 2 Cond Open Ckt Audio	2586-0019	Switchcraft	31
J4	Jk Assy, Output	7040-0045	Cushman	
J5	Jk Assy, Output	7040-0045	Cushman	
J6	Jk Assy, Output	7040-0045	Cushman	
	INDUCTORS			
L1	Choke, 5.6μH, 10%	1585-0028	Delevan	1537-30
L2	Choke, 5.6μH, 10%	1585-0028	Delevan	1537-30
	RESISTORS			
R1	Pot, 10K, 20%, .75W Crmt Lin 5 Trn	1203-0080	CTS	X6P1313-VA305
	SWITCHES			
S1	Sw, Rtry Dpst 3A/125V AC Pnlmt	1851-0108	CTS	BL5245-SFR0279
S2	Sw, Rtry Dpst 3A/125V AC Pnlmt	1851-0108	CTS	BL5245-SFR0279
S3	Sw Assy, Decades Atten	7011-0033	Cushman	
S4	Sw Assy, Units Atten	7011-0032	Cushman	
S5	Switch, 4P2P Rotary	1851-0066	Alco	MSRA-4-2S

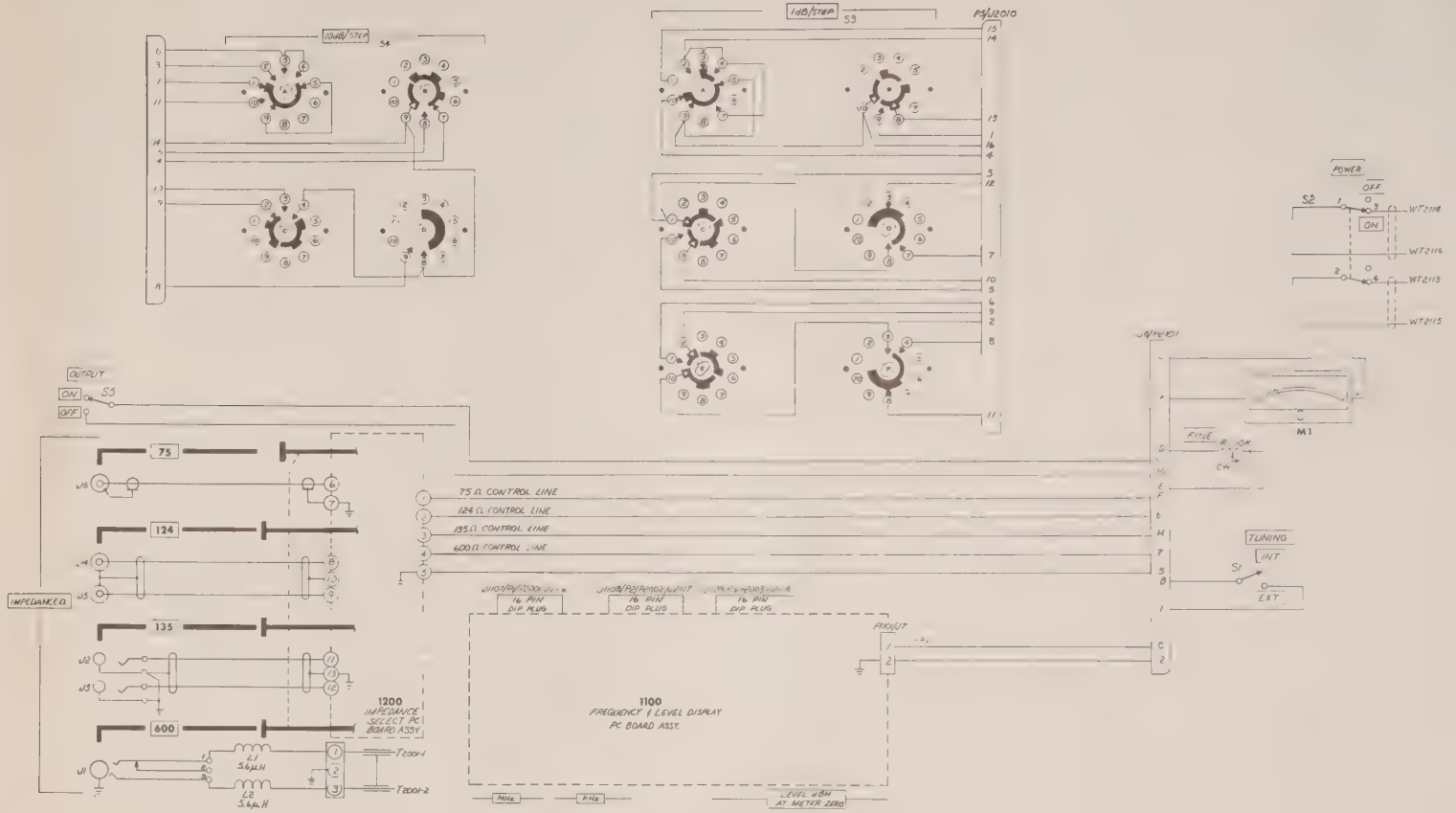


Figure 3-1. Front Panel Interconnection Diagram, 1000

FREQUENCY AND LEVEL DISPLAY, 1100

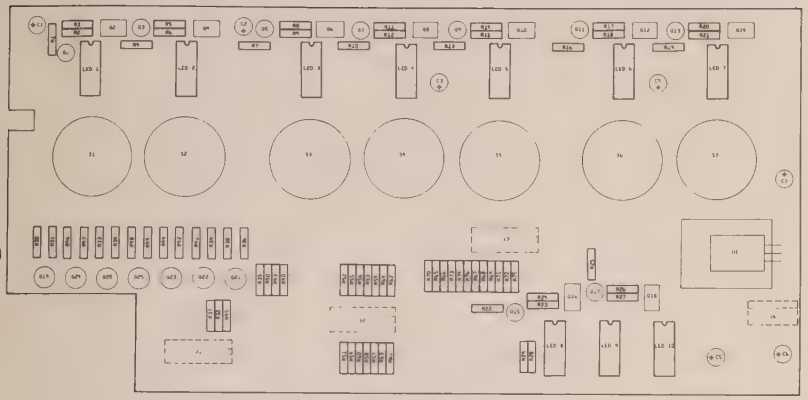
CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
1100	PCB Assy, Freq and Level Display	7001-0407	Cushman	
	PC Board	1780-0590	Cushman	
	CAPACITORS			
C1	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	10/35-20
C2	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	10/35-20
C3	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	10/35-20
C4	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	10/35-20
C5	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	10/35-20
C6	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	10/35-20
C7	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	10/35-20
	DIODES			
CR1	Dio, HP7730 Alpha-Numeric Seg Rdout	1281-0081	HP	5082-7730
CR2	Dio, HP7730 Alpha-Numeric Seg Rdout	1281-0081	HP	5082-7730
CR3	Dio, HP7730 Alpha-Numeric Seg Rdout	1281-0081	HP	5082-7730
CR4	Dio, HP7730 Alpha-Numeric Seg Rdout	1281-0081	HP	5082-7730
CR5	Dio, HP7730 Alpha-Numeric Seg Rdout	1281-0081	HP	5082-7730
CR6	Dio, HP7730 Alpha-Numeric Seg Rdout	1281-0081	HP	5082-7730
CR7	Dio, HP7730 Alpha-Numeric Seg Rdout	1281-0081	HP	5082-7730
CR8	Dio, HP7732 Plrt Ovfl Seg Readout	1281-0082	HP	5082-7732
CR9	Dio, HP7730 Alpha-Numeric Seg Rdout	1281-0081	HP	5082-7730
CR10	Dio, HP7730 Alpha-Numeric Seg Rdout	1281-0081	HP	5082-7730
	CONNECTORS			
J1	Socket, 16 Pin Dual Inline IC	2606-0006	Cinch	133-51-20-006
J2	Socket, 16 Pin Dual Inline IC	2606-0006	Cinch	133-51-20-006
J3	Socket, 16 Pin Dual Inline IC	2606-0006	Cinch	133-51-20-006
J4	Conn, 2 Pin Locking Mintr Jk	2535-0086	Molex	09-65-1021
	TRANSISTORS			
Q1	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q2	Trans, MPS-U55	1272-0074	Motorola	MPS-U55
Q3	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q4	Trans, MPS-U55	1272-0074	Motorola	MPS-U55
Q5	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q6	Trans, MPS-U55	1272-0074	Motorola	MPS-U55
Q7	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q8	Trans, MPS-U55	1272-0074	Motorola	MPS-U55
Q9	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q10	Trans, MPS-U55	1272-0074	Motorola	MPS-U55
Q11	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q12	Trans, MPS-U55	1272-0074	Motorola	MPS-U55
Q13	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q14	Trans, MPS-U55	1272-0074	Motorola	MPS-U55
Q15	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q16	Trans, MPS-U55	1272-0074	Motorola	MPS-U55
Q17	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q18	Trans, MPS-U55	1272-0074	Motorola	MPS-U55
Q19	Trans, 2N3644	1272-0040	Fairchild	2N3644
Q20	Trans, 2N3644	1272-0040	Fairchild	2N3644

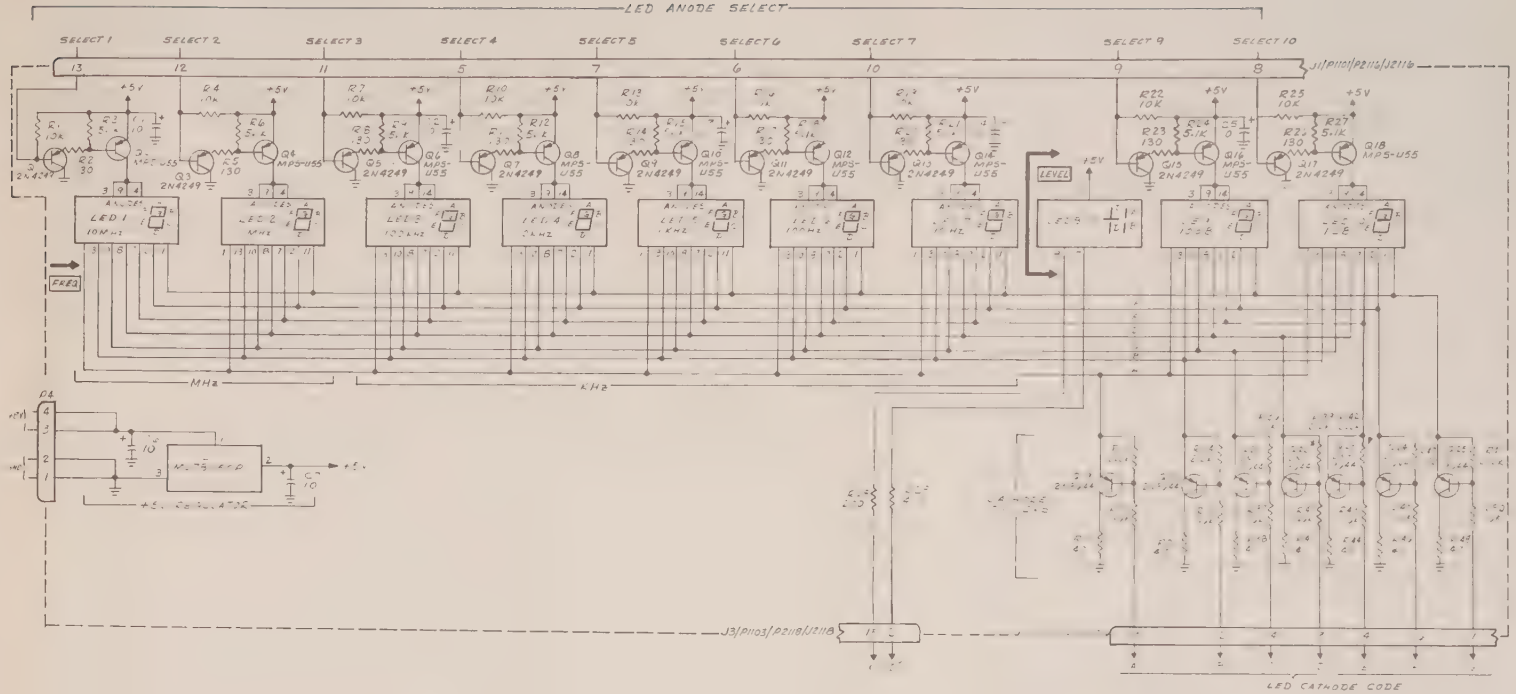
FREQUENCY AND LEVEL DISPLAY, 1100 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
Q21	Trans, 2N3644	1272-0040	Fairchild	2N3644
Q22	Trans, 2N3644	1272-0040	Fairchild	2N3644
Q23	Trans, 2N3644	1272-0040	Fairchild	2N3644
Q24	Trans, 2N3644	1272-0040	Fairchild	2N3644
Q25	Trans, 2N3644	1272-0040	Fairchild	2N3644
	RESISTORS			
R1	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R2	Res, 130 Ohm, 5%, 1/4W Comp	1066-1315	Allen-Bradley	CB1315
R3	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R4	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R5	Res, 130 Ohm, 5%, 1/4W Comp	1066-1315	Allen-Bradley	CB1315
R6	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R7	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R8	Res, 130 Ohm, 5%, 1/4W Comp	1066-1315	Allen-Bradley	CB1315
R9	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R10	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R11	Res, 130 Ohm, 5%, 1/4W Comp	1066-1315	Allen-Bradley	CB1315
R12	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R13	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R14	Res, 130 Ohm, 5%, 1/4W Comp	1066-1315	Allen-Bradley	CB1315
R15	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R16	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R17	Res, 130 Ohm, 5%, 1/4W Comp	1066-1315	Allen-Bradley	CB1315
R18	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R19	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R20	Res, 130 Ohm, 5%, 1/4W Comp	1066-1315	Allen-Bradley	CB1315
R21	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R22	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R23	Res, 130 Ohm, 5%, 1/4W Comp	1066-1315	Allen-Bradley	CB1315
R24	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R25	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R26	Res, 130 Ohm, 5%, 1/4W Comp	1066-1315	Allen-Bradley	CB1315
R27	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R28	Res, 200 Ohm, 5%, 1/4W Comp	1066-2015	Allen-Bradley	CB2015
R29	Res, 430 Ohm, 5%, 1/4W Comp	1066-4315	Allen-Bradley	CB4315
R30	Res, 47 Ohm, 5%, 1/4W Comp	1066-4705	Allen-Bradley	CB4705
R31	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R32	Res, 1.6K, 5%, 1/4W Comp	1066-1625	Allen-Bradley	CB1625
R33	Res, 47 Ohm, 5%, 1/4W Comp	1066-4705	Allen-Bradley	CB4705
R34	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R35	Res, 1.6K, 5%, 1/4W Comp	1066-1625	Allen-Bradley	CB1625
R36	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R37	Res, 1.6K, 5%, 1/4W Comp	1066-1625	Allen-Bradley	CB1625
R38	Res, 47 Ohm, 5%, 1/4W Comp	1066-4705	Allen-Bradley	CB4705
R39	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R40	Res, 1.6K, 5%, 1/4W Comp	1066-1625	Allen-Bradley	CB1625
R41	Res, 47 Ohm, 5%, 1/4W Comp	1066-4705	Allen-Bradley	CB4705
R42	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R43	Res, 1.6K, 5%, 1/4W Comp	1066-1625	Allen-Bradley	CB1625
R44	Res, 47 Ohm, 5%, 1/4W Comp	1066-4705	Allen-Bradley	CB4705
R45	Res, 1.6K, 5%, 1/4W Comp	1066-1625	Allen-Bradley	CB1625

FREQUENCY AND LEVEL DISPLAY, 1100 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R46	Res, 47 Ohm, 5%, 1/4W Comp	1066-4705	Allen-Bradley	CB4705
R47	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R48	Res, 47 Ohm, 5%, 1/4W Comp	1066-4705	Allen-Bradley	CB4705
R49	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R50	Res, 1.6K, 5%, 1/4W Comp	1066-1625	Allen-Bradley	CB1625
R51	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R52	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R53	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R54	Res, 150 Ohm, 5%, 1/4W Comp	1066-1515	Allen-Bradley	CB1515
R55	Res, 150 Ohm, 5%, 1/4W Comp	1066-1515	Allen-Bradley	CB1515
R56	Res, 150 Ohm, 5%, 1/4W Comp	1066-1515	Allen-Bradley	CB1515
R57	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R58	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R59	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R60	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R61	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R62	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R63	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R64	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R65	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R66	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R67	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R68	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R69	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R70	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R71	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R72	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R73	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R74	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R75	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
R76	Res, 750 Ohm, 5%, 1/4W Comp	1066-7515	Allen-Bradley	CB7515
	SWITCHES			
S1	Sw, Rtry 1 Pole 3 Pos PCB Mt	1851-0096	Cushman	
S2	Sw, Rtry 4 Pole 10 Pos PCB Mt	1851-0095	Cushman	
S3	Sw, Rtry 4 Pole 10 Pos PCB Mt	1851-0095	Cushman	
S4	Sw, Rtry 4 Pole 10 Pos PCB Mt	1851-0095	Cushman	
S5	Sw, Rtry 4 Pole 10 Pos PCB Mt	1851-0095	Cushman	
S6	Sw, Rtry 4 Pole 10 Pos PCB Mt	1851-0095	Cushman	
S7	Sw, Rtry 4 Pole 10 Pos PCB Mt	1851-0095	Cushman	
	INTEGRATED CIRCUIT			
U1	IC, MC7805CP, 5V Pos Rgltr	2025-0088	Motorola	MC7805CP





NOTE
1. RESISTORS - 1/4W, 5% VALUES IN OHMS UNLESS OTHERWISE NOTED.
2. CAPACITORS - VALUES IN μF UNLESS OTHERWISE NOTED.
3. INDUCTORS - VALUES IN μH UNLESS OTHERWISE NOTED.
4. *FACTORY SELECT. TYPICAL VALUE SHOWN.
5. ALL VOLTAGES ARE DC UNLESS OTHERWISE NOTED.

ASSY	TYPE
7	HP7730
8	HP7732

5601**0066

Figure 3-2. Frequency and Level Display, 1100, sheet 1

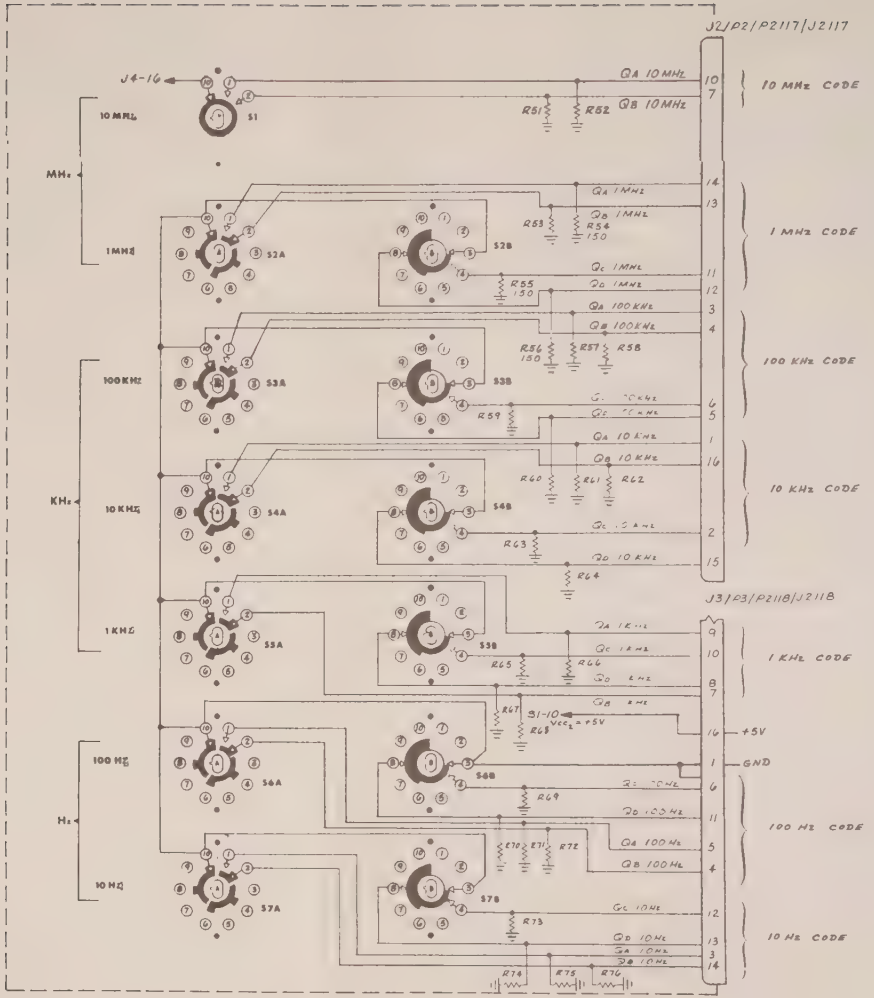
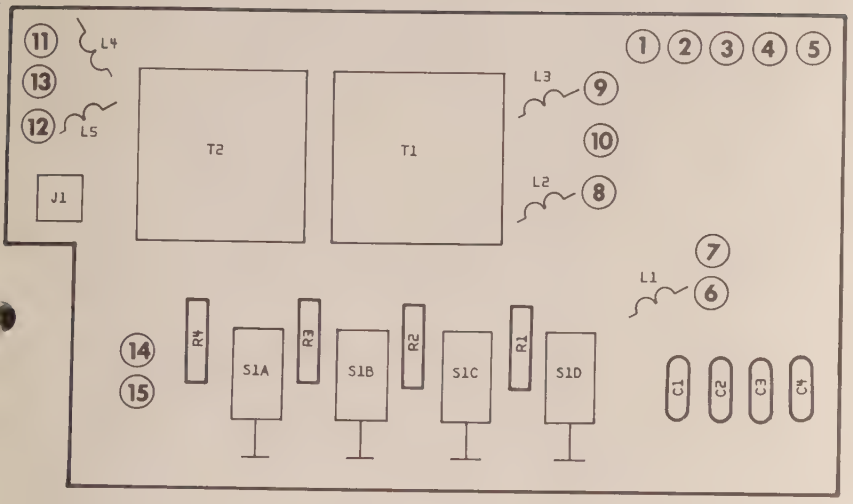
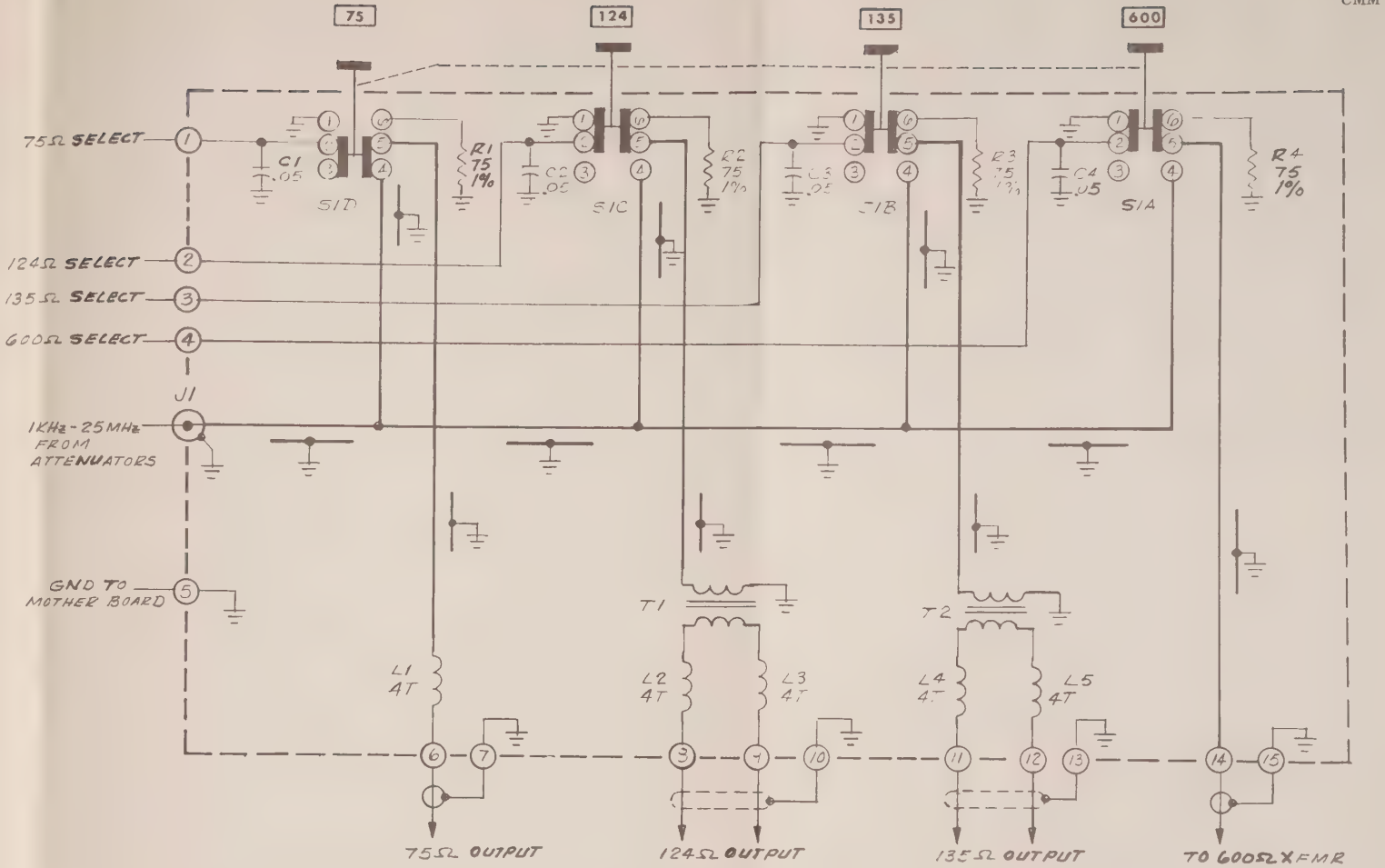


Figure 3-3. Frequency and Level Display, 1100, sheet 2

IMPEDANCE SELECTOR, 1200

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
1200	PCB Assy, Impedance Selector	7001-0406	Cushman	
	PC Board	1780-0592	Cushman	
	CAPACITORS			
C1	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C2	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C3	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C4	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
	CONNECTOR			
J1	Conn, SMB 50 Ohm Str Jk Pc Mt Snap-on	2536-0071	Cablewave	700209
	INDUCTORS			
L1	Assy, Coil, Air Core	1596-0072	Cushman	
L2	Assy, Coil, Air Core	1596-0072	Cushman	
L3	Assy, Coil, Air Core	1596-0072	Cushman	
L4	Assy, Coil, Air Core	1596-0072	Cushman	
L5	Assy, Coil, Air Core	1596-0072	Cushman	
	RESISTORS			
R1	Res, 75 Ohm, 1%, 1/8W MF	1075-0035	Dale	MF 1/8
R2	Res, 75 Ohm, 1%, 1/8W MF	1075-0035	Dale	MF 1/8
R3	Res, 75 Ohm, 1%, 1/8W MF	1075-0035	Dale	MF 1/8
R4	Res, 75 Ohm, 1%, 1/8W MF	1075-0035	Dale	MF 1/8
	SWITCH			
S1	Sw, PB 4 Sta Dpst Mech Color Ind	1852-0032	Cushman	
	TRANSFORMERS			
T1	Xfmr, 75 Ohm to 124 Ohm Output	1576-0006	Cushman	
T2	Xfmr, 75 Ohm to 135 Ohm Output	1576-0007	Cushman	





NOTE:

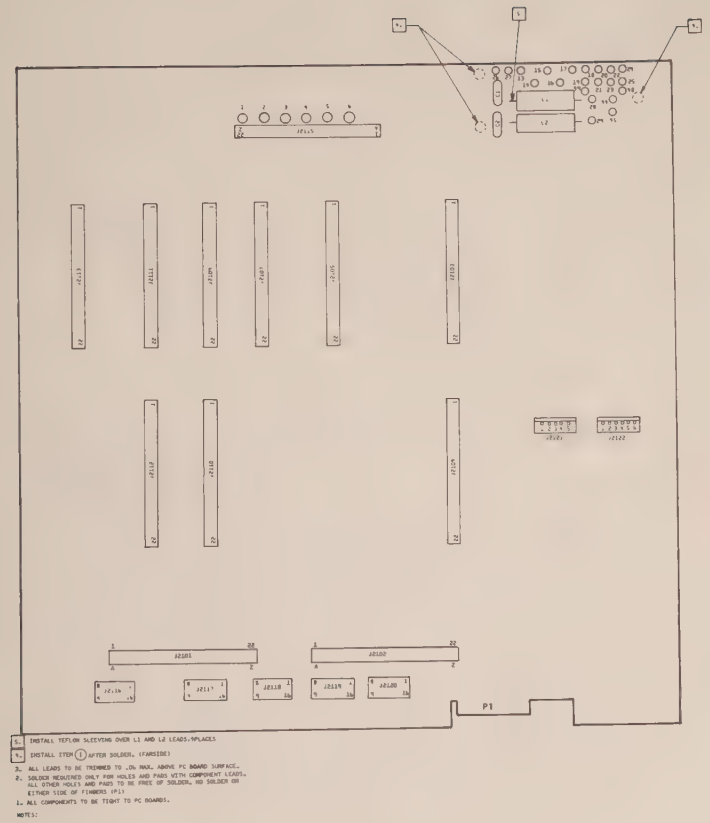
1. RESISTORS - 1/4W, 5% VALUES IN OHMS UNLESS OTHERWISE NOTED.
2. CAPACITORS - VALUES IN μF UNLESS OTHERWISE NOTED.
3. INDUCTORS - VALUES IN μH UNLESS OTHERWISE NOTED.
4. *FACTORY SELECT. TYPICAL VALUE SHOWN.
5. ALL VOLTAGES ARE DC UNLESS OTHERWISE NOTED.

5601-0066

Figure 3-4. Impedance Selector, 1200

MAIN CHASSIS MOTHER BOARD, 2000, 2100

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
2000	PCB Assy, Main Chassis	7001-0404	Cushman	
	PC Board	1780-0593	Cushman	
	CAPACITORS			
C1	Cap, 2200PF, 20%, 3K Disc	1005-0098	Sprague	30GA-D22
C2	Cap, 2200PF, 20%, 3K Disc	1005-0098	Sprague	30GA-D22
	CONNECTORS			
J1	Conn, 44 Cont Dbl Row Dip Term PCB Jk	2535-0076	Amphenol	225-22221-103
J2	Conn, 44 Cont Dbl Row Dip Term PCB Jk	2535-0076	Amphenol	225-22221-103
J3	Conn, 22 Cont Single Row	2535-0078	Amphenol	225-22251-104
J4	Conn, 22 Cont Single Row	2535-0078	Amphenol	225-22251-104
J5	Conn, 22 Cont Single Row	2535-0078	Amphenol	225-22251-104
J6	Not Used			
J7	Conn, 22 Cont Single Row	2535-0078	Amphenol	225-22251-104
J8	Not Used			
J9	Conn, 22 Cont Single Row	2535-0078	Amphenol	225-22251-104
J10	Conn, 22 Cont Single Row	2535-0078	Amphenol	225-22251-104
J11	Conn, 22 Cont Single Row	2535-0078	Amphenol	225-22251-104
J12	Conn, 22 Cont Single Row	2535-0078	Amphenol	225-22251-104
J13	Conn, 22 Cont Single Row	2535-0078	Amphenol	225-22251-104
J14	Not Used			
J15	Conn, 44 Cont Dbl Row Dip Term PCB Jk	2535-0076	Amphenol	225-22221-103
J16	Socket, 16 Pin Dual Inline IC	2606-0006	Cinch	133-51-20-006
J17	Socket, 16 Pin Dual Inline IC	2606-0006	Cinch	133-51-20-006
J18	Socket, 16 Pin Dual Inline IC	2606-0006	Cinch	133-51-20-006
J19	Socket, 16 Pin Dual Inline IC	2606-0006	Cinch	133-51-20-006
J20	Socket, 16 Pin Dual Inline IC	2606-0006	Cinch	133-51-20-006
J21	Conn, 5 Pin Locking Mintr Jk	2535-0075	Molex	09-65-1051
J22	Conn, 6 Pin Locking Mintr Jk	2535-0074	Molex	09-65-1061


P1
NOTES:
1. ALL COMPONENTS TO BE TIGHT TO PC BOARDS.
2. SOLDER REQUIRED ONLY FOR HOLES AND PADS WITH COMPONENT LEADS. ALL OTHER HOLES AND PADS TO BE FREE OF SOLDER. NO SOLDER ON EITHER SIDE OF FINGERS (P1)
3. ALL LEADS TO BE TRIMMED TO .04 MAX. ABOVE PC BOARD SURFACE.
4. INSTALL ITEM (1) AFTER SOLDER. (FARSIDE)
5. INSTALL TEFLON SLEEVING OVER L1 AND L2 LEADS-4PLACES

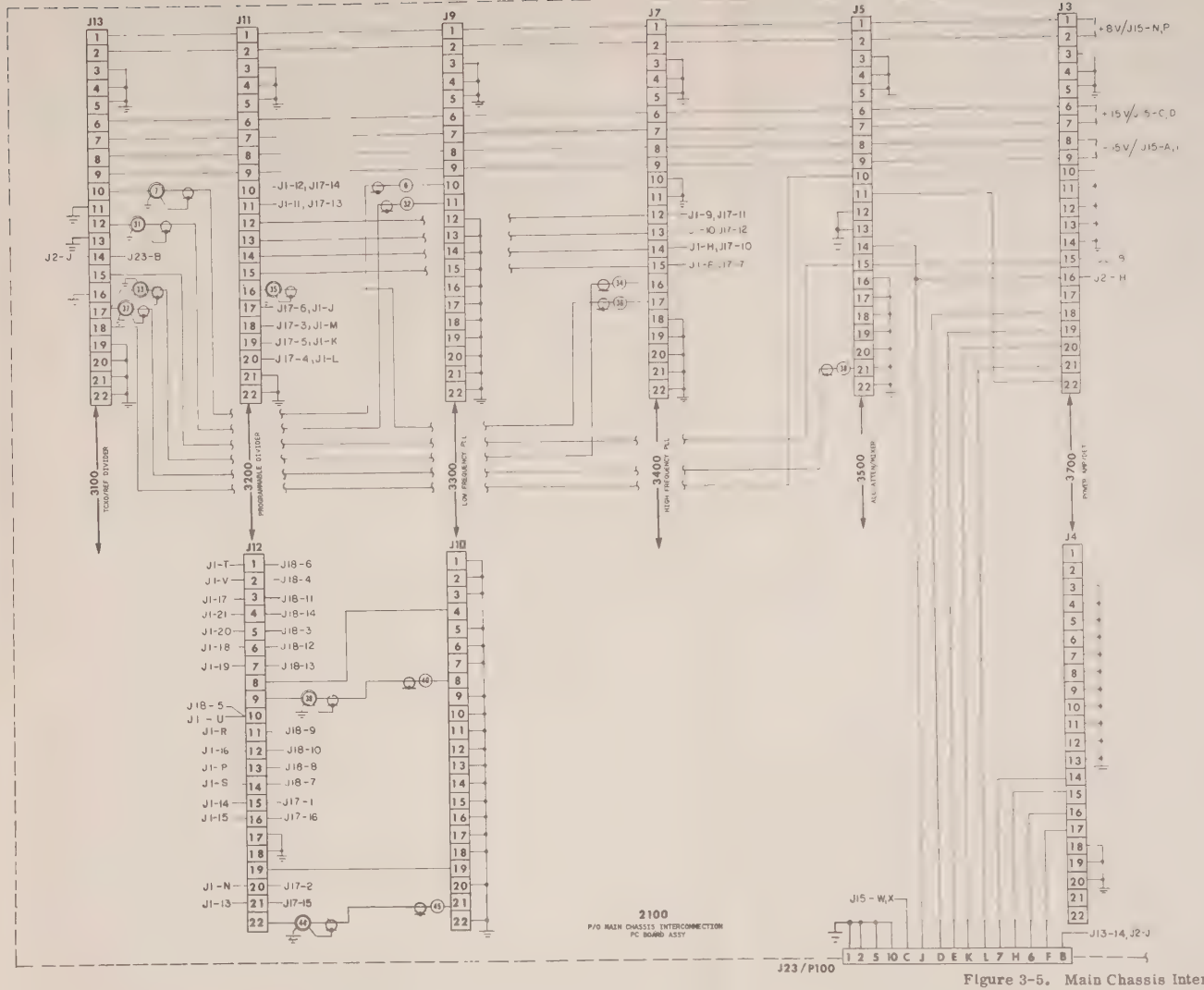


Figure 3-5. Main Chassis Interconnection Diagram, 2000

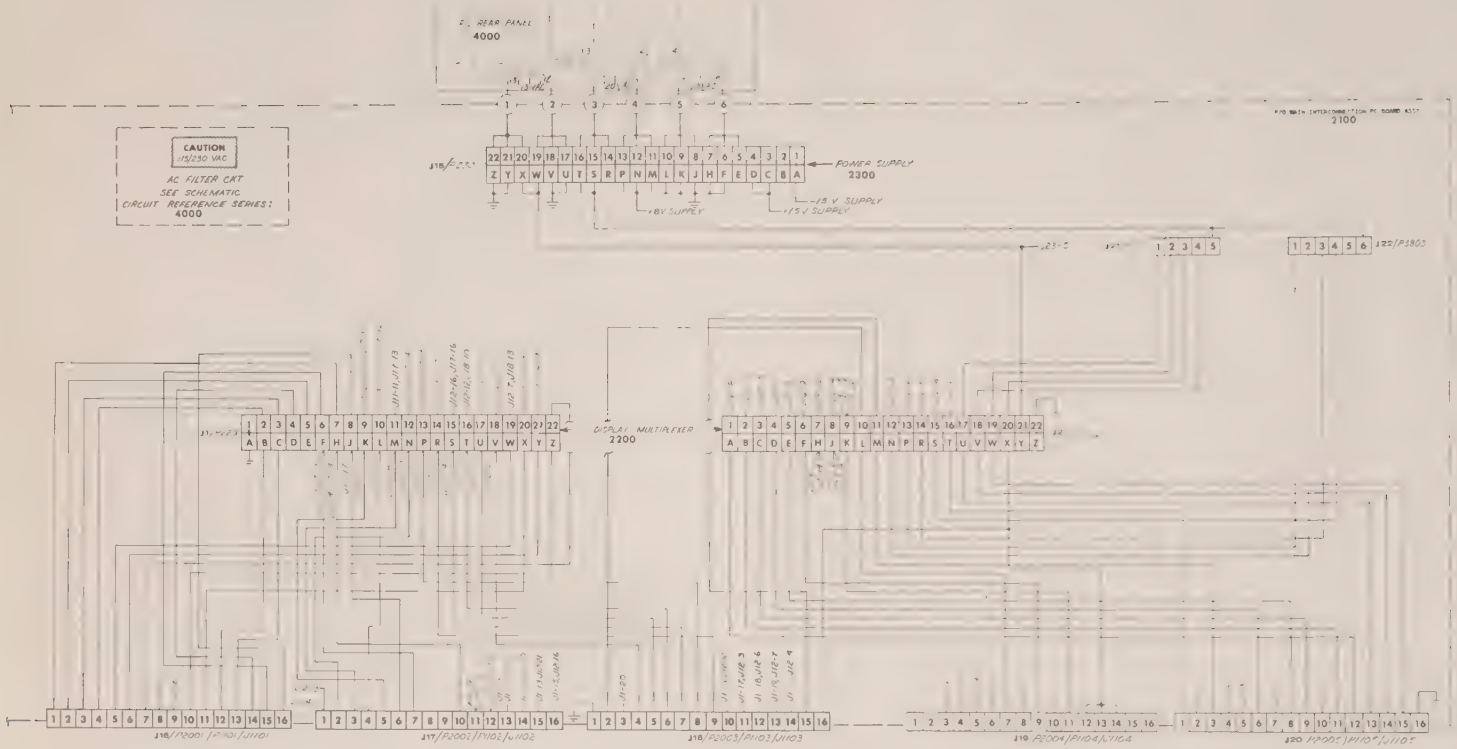


Figure 3-6. Main Chassis Mother Board, 2100

DISPLAY MULTIPLEXER, 2200

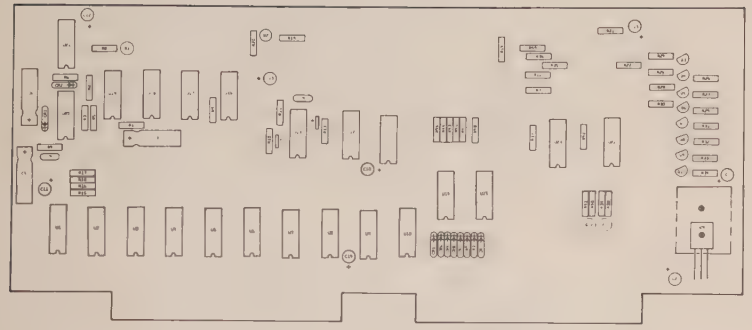
CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
2200	PCB Assy, Display Multiplexer	7001-0405	Cushman	
	PC Board	1780-0589	Cushman	
	CAPACITORS			
C1	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C2	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C3	Cap, 100μF, +75-10%, 12V	1013-0011	Sprague	30D107G012CC5
C4	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C5	Cap, 100μF, +75-10%, 12V	1013-0011	Sprague	30D107G012CC5
C6	Cap, 100μF, +75-10%, 12V	1013-0011	Sprague	30D107G012CC5
C7	Cap, .1μF, 10%, 100V	1005-0064	Aerovox	CK06BX104K
C8	Cap, .01μF, 10%, 200V	1005-0065	Aerovox	CK06BX103K
C9	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C10	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C11	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C12	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C13	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C14	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C15	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
	DIODES			
CR1	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR2	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR3	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR4	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR5	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR6	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR7	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR8	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR9	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR10	Diode, 1N3064	1281-0013	Teledyne	1N3064
	TRANSISTORS			
Q1	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q2	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q3	Xstr, 2N4124, NPN Si	1272-0091	Fairchild	2N4124
Q4	Xstr, 2N4124, NPN Si	1272-0091	Fairchild	2N4124
Q5	Xstr, 2N4124, NPN Si	1272-0091	Fairchild	2N4124
Q6	Xstr, 2N4124, NPN Si	1272-0091	Fairchild	2N4124
Q7	Xstr, 2N4124, NPN Si	1272-0091	Fairchild	2N4124
Q8	Xstr, 2N4124, NPN Si	1272-0091	Fairchild	2N4124
Q9	Xstr, 2N4124, NPN Si	1272-0091	Fairchild	2N4124
Q10	Xstr, 2N4124, NPN Si	1272-0091	Fairchild	2N4124
Q11	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q12	Trans, 2N4249	1272-0024	Fairchild	2N4249
	RESISTORS			
R1	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R2	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R3	Res, 270 Ohm, 5%, 1/4W Comp	1066-2715	Allen-Bradley	CB2715
R4	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R5	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035

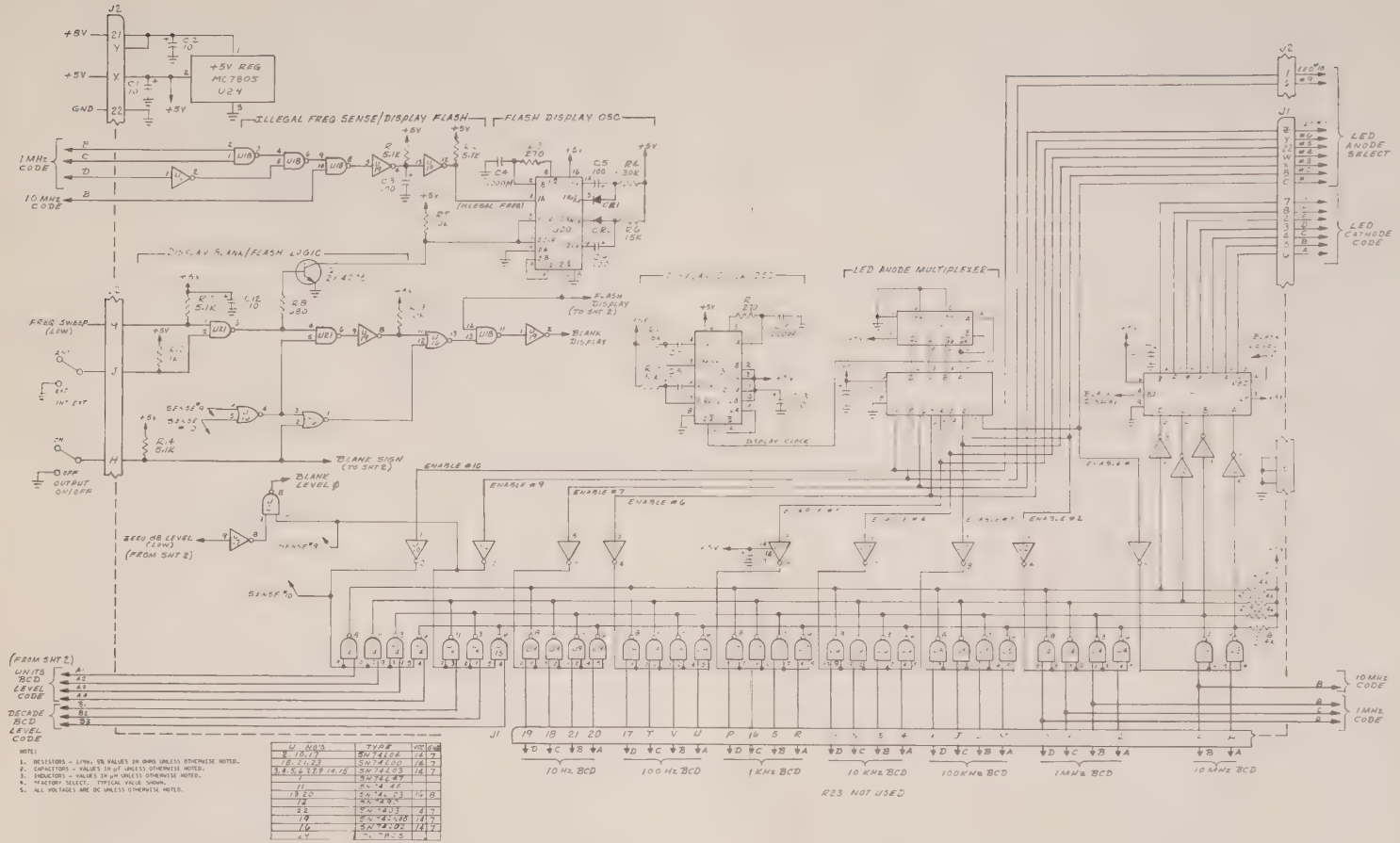
DISPLAY MULTIPLEXER, 2200 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R6	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R7	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R8	Res, 680 Ohm, 5%, 1/4W Comp	1066-6815	Allen-Bradley	CB6815
R9	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R10	Res, 18K, 5%, 1/4W Comp	1066-1835	Allen-Bradley	CB1835
R11	Res, 270 Ohm, 5%, 1/4W Comp	1066-2715	Allen-Bradley	CB2715
R12	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R13	Res, 9.1K, 5%, 1/4W Comp	1066-9125	Allen-Bradley	CB9125
R14	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R15	Res, 2.4K, 5%, 1/4W Comp	1066-2425	Allen-Bradley	CB2425
R16	Res, 2.4K, 5%, 1/4W Comp	1066-2425	Allen-Bradley	CB2425
R17	Res, 2.4K, 5%, 1/4W Comp	1066-2425	Allen-Bradley	CB2425
R18	Res, 2.4K, 5%, 1/4W Comp	1066-2425	Allen-Bradley	CB2425
R19	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R20	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R21	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R22	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R23	Deleted per RD461			
R24	Res, 680 Ohm, 5%, 1/4W Comp	1066-6815	Allen-Bradley	CB6815
R25	Res, 4.3K, 5%, 1/4W Comp	1066-4325	Allen-Bradley	CB4325
R26	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R27	Res, 4.3K, 5%, 1/4W Comp	1066-4325	Allen-Bradley	CB4325
R28	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R29	Res, 4.3K, 5%, 1/4W Comp	1066-4325	Allen-Bradley	CB4325
R30	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R31	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R32	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R33	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R34	Res, 2.7K, 5%, 1/4W Comp	1066-2725	Allen-Bradley	CB2725
R35	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R36	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R37	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R38	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R39	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R40	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R41	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R42	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R43	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R44	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R45	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R46	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R47	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R48	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R49	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
	INTEGRATED CIRCUITS			
U1	IC, SN74L47N	2025-0078	T.I.	SN74L47N
U2	IC, SN74L04N, Hex Inverter	2025-0038	T.I.	SN74L04N
U3	IC, SN74L03N	2025-0080	T.I.	SN74L03N
U4	IC, SN74L03N	2025-0080	T.I.	SN74L03N
U5	IC, SN74L03N	2025-0080	T.I.	SN74L03N

DISPLAY MULTIPLEXER, 2200 (cont)

CKT. REF.	DESCRIPTION
U6	IC, SN74L03N
U7	IC, SN74L03N
U8	IC, SN74L03N
U9	IC, SN74L03N
U10	IC, SN74L04N, Hex Inverter
U11	IC, SN74145N
U12	IC, SN7490N
U13	IC, SN74L123N, Dl. Mnstbl.
U14	IC, SN74L03N
U15	IC, SN74L03N
U16	IC, SN74L02N, Quad 2-Input
U17	IC, SN74L04N, Hex Inverter
U18	IC, SN74L00N
U19	IC, 74LS05, Hex Inverter
U20	IC, SN74L123N, Dl. Mnstbl.
U21	IC, SN74L00N
U22	IC, SN7403N, Quad 2-Input P
U23	IC, SN74L00N
U24	IC, MC7805CP, 5V Pos Rglt





U NOS	TYPE	VCC GND
2, 10, 17	SN74L04	14, 7
1, 6, 11, 23	SN74L00	14, 7
3, 4, 5, 6, 7, 9, 14, 15	SN74L03	14, 7
7	SN74L47	
11	SN74L42	
13, 20	SN74L23	14, 8
18	MC1489	
22	SN74L03	4, 7
19	SN74L08	14, 7
16	SN74L02	14, 7
24	MC78L05	

NOTE:
1. RESISTORS – 1/4W, 5% VALUES IN OHMS UNLESS OTHERWISE NOTED.
2. CAPACITORS – VALUES IN µF UNLESS OTHERWISE NOTED.
3. INDUCTORS – VALUES IN µH UNLESS OTHERWISE NOTED.
4. FACTORY SELECT. TYPICAL VALUE SHOWN.
5. ALL VOLTAGES ARE DC UNLESS OTHERWISE NOTED.

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Figure 3-7. Display Multiplexer, 2200, sheet 1

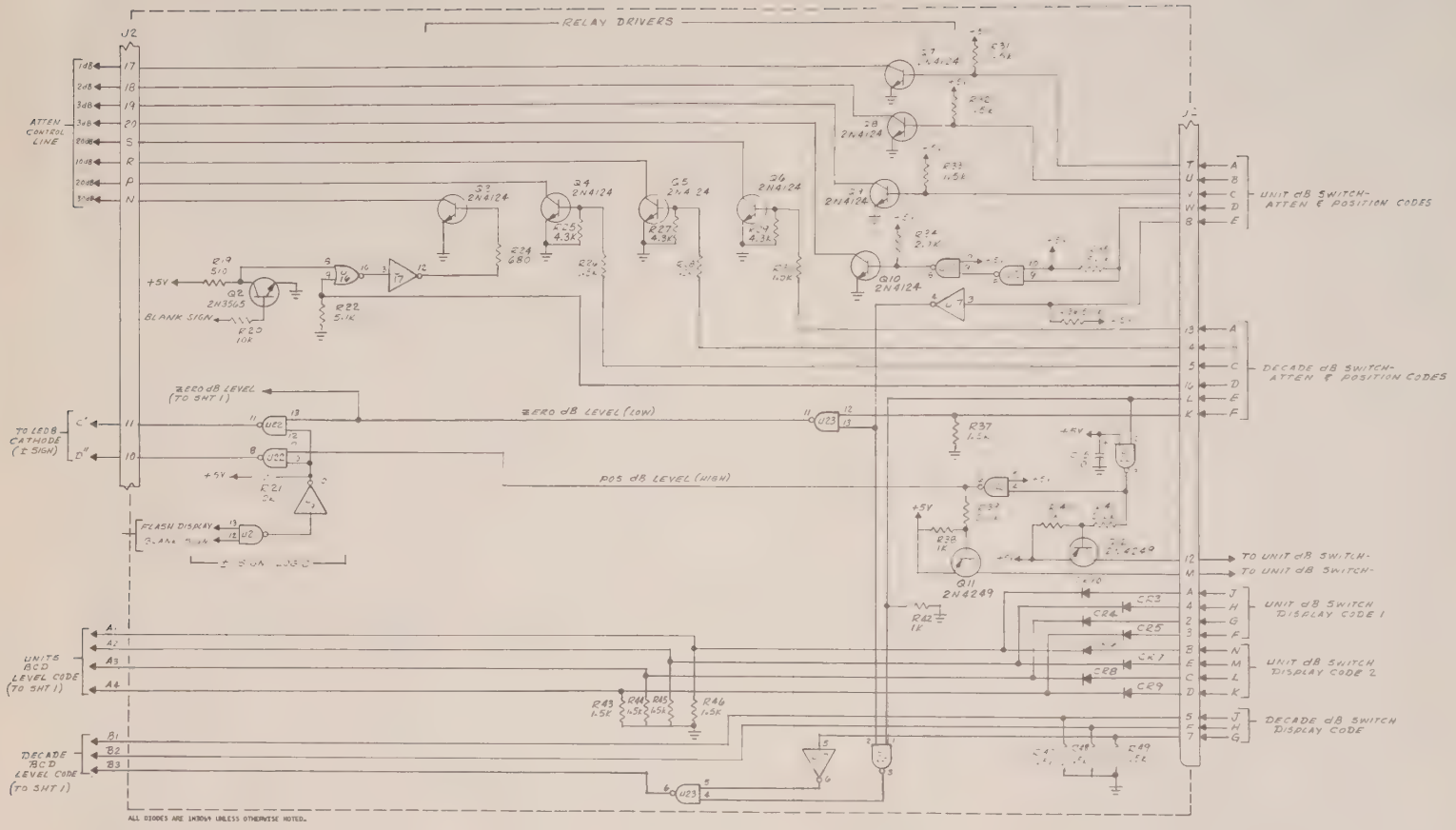
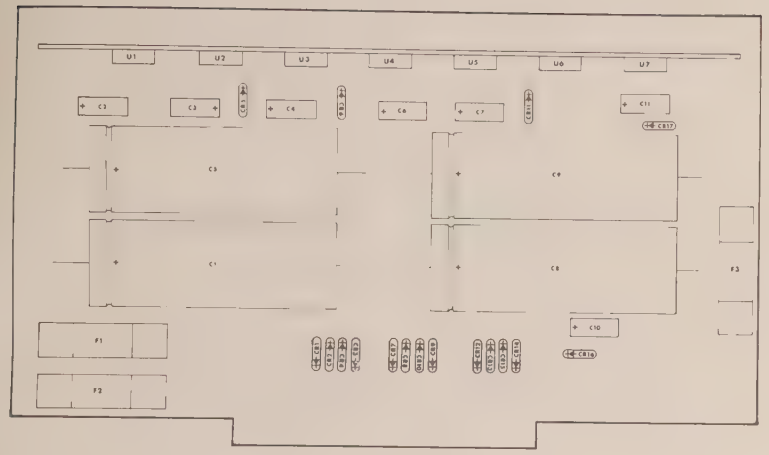
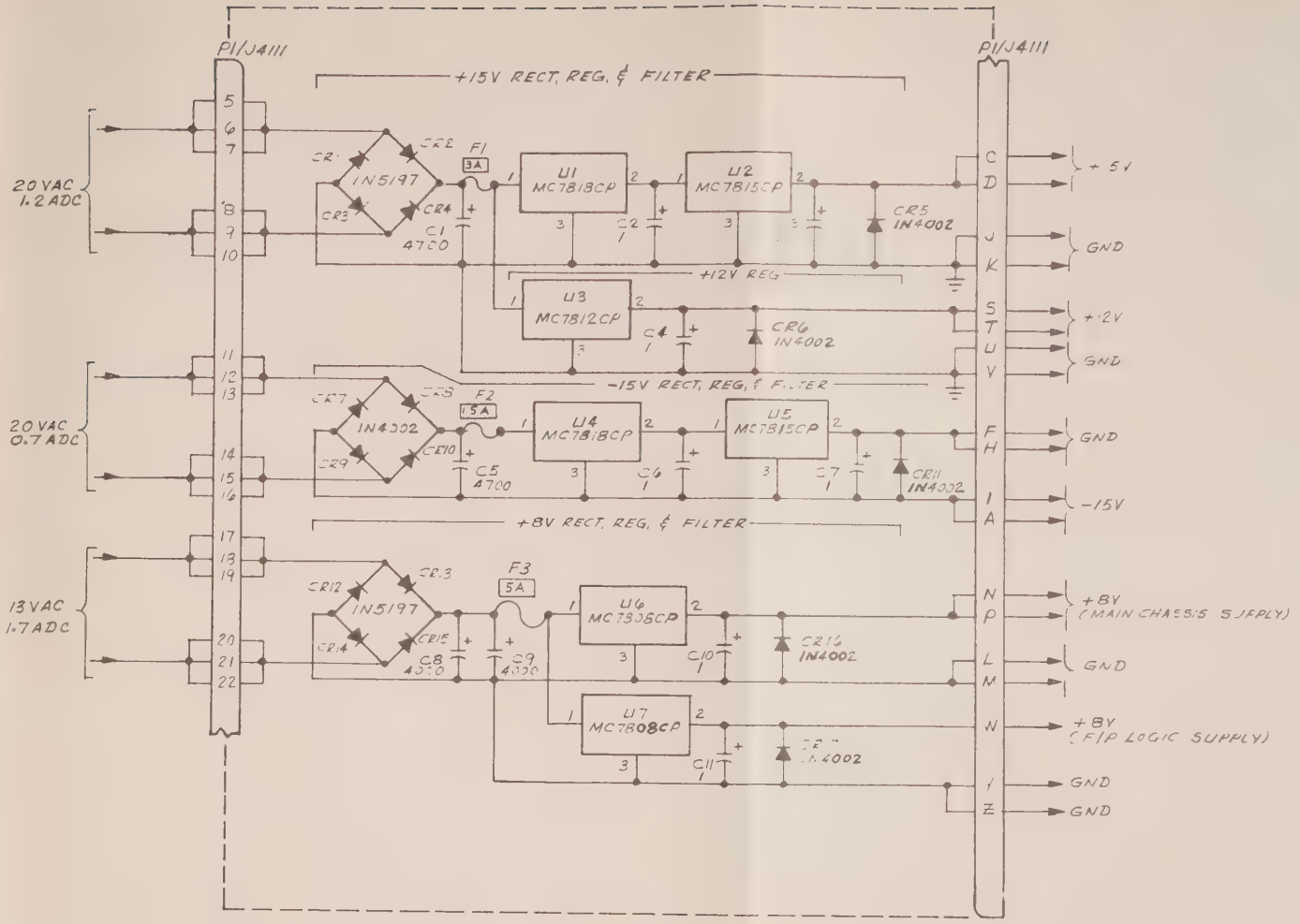


Figure 3-8. Display Multiplexer, 2200, sheet 2

POWER SUPPLY, 2300

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
2300	PCB Assy, Power Supply	7001-0408	Cushman	
	PC Board	1780-0558	Cushman	
	CAPACITORS			
C1	Cap, 4700μF, +150-10%, 35V	1014-0018	Ill. Elna	35T4700
C2	Cap, 1μF 50V DC, 10% Electrolytic	1013-0004	Sprague	30D105G025BA5
C3	Cap, 1μF 50V DC, 10% Electrolytic	1013-0004	Sprague	30D105G025BA5
C4	Cap, 1μF 50V DC, 10% Electrolytic	1013-0004	Sprague	30D105G025BA5
C5	Cap, 4700μF, +150-10%, 35V	1014-0018	Ill. Elna	35T4700
C6	Cap, 1μF 50V DC, 10% Electrolytic	1013-0004	Sprague	30D105G025BA5
C7	Cap, 1μF 50V DC, 10% Electrolytic	1013-0004	Sprague	30D105G025BA5
C8	Cap, 4000μF, +75-10%, 25V	1014-0005	Sprague	39D408G025JS5
C9	Cap, 4000μF, +75-10%, 25V	1014-0005	Sprague	39D408G025JS5
C10	Cap, 1μF 50V DC, 10% Electrolytic	1013-0004	Sprague	30D105G025BA5
C11	Cap, 1μF 50V DC, 10% Electrolytic	1013-0004	Sprague	30D105G025BA5
	DIODES			
CR1	Diode, 1N5197 or 1N5171	1281-0024	Semtech	1N5197
CR2	Diode, 1N5197 or 1N5171	1281-0024	Semtech	1N5197
CR3	Diode, 1N5197 or 1N5171	1281-0024	Semtech	1N5197
CR4	Diode, 1N5197 or 1N5171	1281-0024	Semtech	1N5197
CR5	Diode, 1N4002	1281-0023	ITT	1N4002
CR6	Diode, 1N4002	1281-0023	ITT	1N4002
CR7	Diode, 1N4002	1281-0023	ITT	1N4002
CR8	Diode, 1N4002	1281-0023	ITT	1N4002
CR9	Diode, 1N4002	1281-0023	ITT	1N4002
CR10	Diode, 1N4002	1281-0023	ITT	1N4002
CR11	Diode, 1N4002	1281-0023	ITT	1N4002
CR12	Diode, 1N5197 or 1N5171	1281-0024	Semtech	1N5197
CR13	Diode, 1N5197 or 1N5171	1281-0024	Semtech	1N5197
CR14	Diode, 1N5197 or 1N5171	1281-0024	Semtech	1N5197
CR15	Diode, 1N5197 or 1N5171	1281-0024	Semtech	1N5197
CR16	Diode, 1N4002	1281-0023	ITT	1N4002
CR17	Diode, 1N4002	1281-0023	ITT	1N4002
	FUSES			
F1	FU, 3 Amp/250V 3AG Fast Blow	1955-0027	Littelfuse	312003
F2	Fuse, 1 1/2 Amp	1955-0007	Littelfuse	31201.5
F3	FU, 5 Amp/250V 3AG Fast Blow	1955-0026	Littelfuse	312005
	INTEGRATED CIRCUITS			
U1	IC, MC7818CP, 18V Pos Rgltr	2025-0103	Motorola	MC7818CP
U2	IC, MC7815CP, 15V Pos Rgltr	2025-0101	Motorola	MC7815CP
U3	IC, MC7812CP, 12V Pos Rgltr	2025-0100	Motorola	MC7812CP
U4	IC, MC7818CP, 18V Pos Rgltr	2025-0103	Motorola	MC7818CP
U5	IC, MC7815CP, 15V Pos Rgltr	2025-0101	Motorola	MC7815CP
U6	IC, MC7808CP, 8V Pos Rgltr	2025-0102	Motorola	MC7808CP
U7	IC, MC7808CP, 8V Pos Rgltr	2025-0102	Motorola	MC7808CP





NOTE:

1. RESISTORS - 1/4W, 5% VALUES IN OHMS UNLESS OTHERWISE NOTED.
2. CAPACITORS - VALUES IN μF UNLESS OTHERWISE NOTED.
3. INDUCTORS - VALUES IN μH UNLESS OTHERWISE NOTED.
4. *FACTORY SELECT. TYPICAL VALUE SHOWN.
5. ALL VOLTAGES ARE DC UNLESS OTHERWISE NOTED.
6. ALL FUSES ARE FAST-BLOW.

C12, CR18, U8 DELETED

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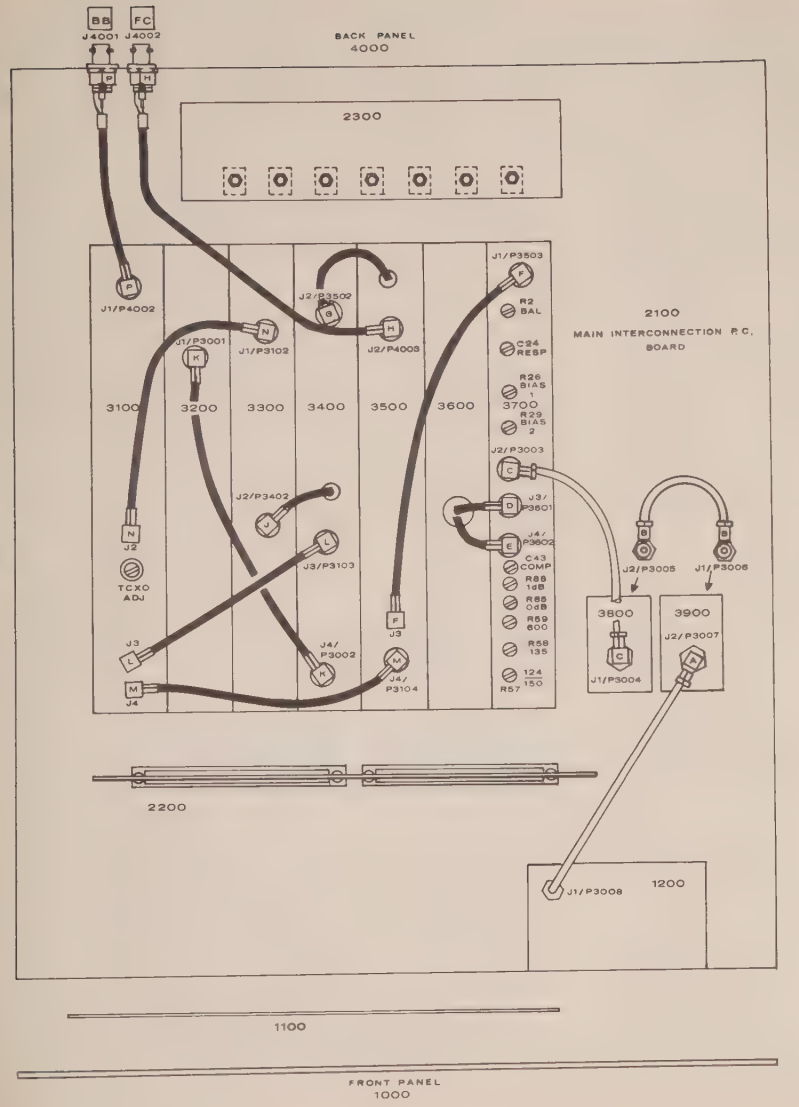
Figure 3-9. Power Supply, 2300



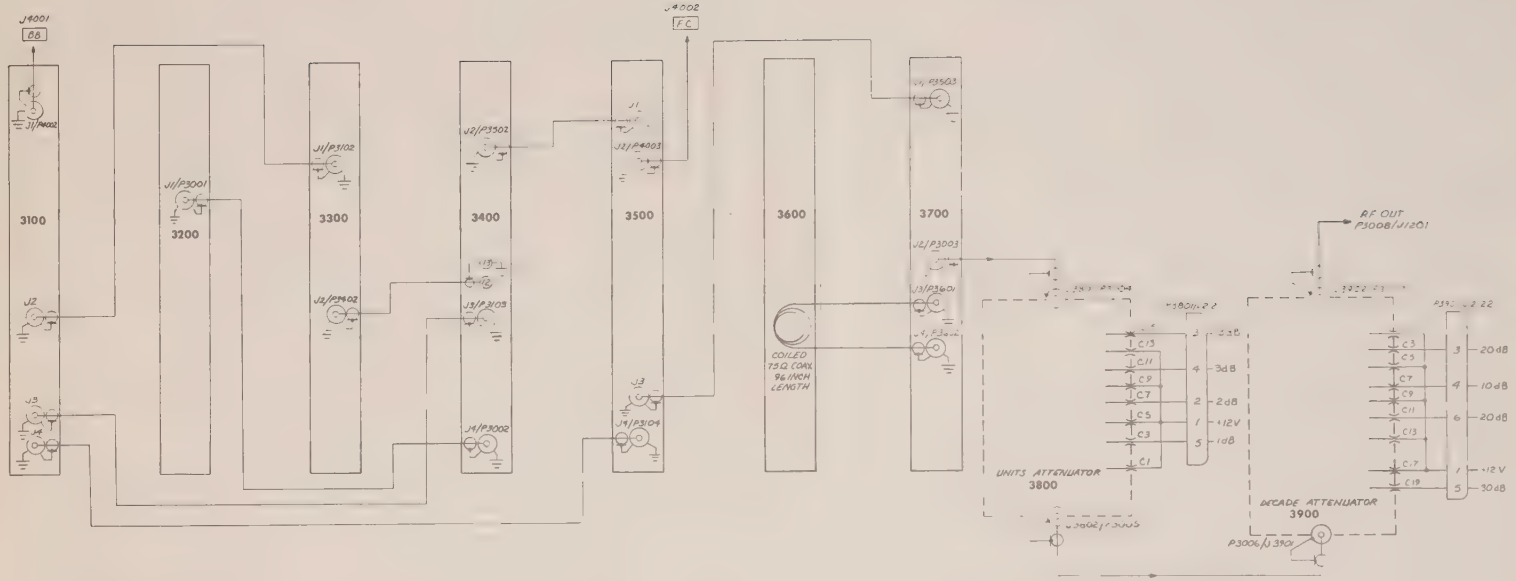


Figure 3-10. Main Interconnection Diagram, 3000

TCXO/REFERENCE DIVIDER, 3100

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
3100	PCB Assy, Reference Divider	7001-0410	Cushman	
	PC Board	1780-0587	Cushman	
	CAPACITORS			
C1	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C2	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C3	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C4	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C5	Cap, 100μF, 10%, 25V	1013-0003	Sprague	30D107G025DD5
C6	Cap, 100μF, 10%, 25V	1013-0003	Sprague	30D107G025DD5
C7	Cap, 100μF, 10%, 25V	1013-0003	Sprague	30D107G025DD5
C8	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C9	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C10	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U-503Z
C11	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C12	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C13	Cap, 43PF, 5%, 500V Mica	1002-0046	Elmenco	DM15-E-430J
C14	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C15	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C16	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C17	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C18	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C19	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C20	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C21	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C22	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C23	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C24	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C25	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C26	Cap, 3.3μF, 10%, 15V	1011-0008	Kemet	K3R3C15K
C27	Cap, 30PF, 5%, 500V Mica	1002-0043	Elmenco	DM15-E-300J
C28	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C29	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C30	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C31	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C32	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C33	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C34	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C35	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C36	Cap, 10PF, 5%, 500V Mica	1002-0016	Elmenco	DM15-C-100J
C37	Cap, 10PF, 5%, 500V Mica	1002-0016	Elmenco	DM15-C-100J
C38	Cap, 10μF, 10%, 20V	1011-0007	Kemet	K10C20K
C39	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C40	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C41	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C42	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C43	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C44	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C45	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C46	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C47	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C48	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C49	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C50	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z

TCXO/REFERENCE DIVIDER, 3100 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
C51	Cap, 43PF, 5%, 500V Mica	1002-0046	Elmenco	DM15-E-430J
C52	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C53	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C54	Cap, 43PF, 5%, 500V Mica	1002-0046	Elmenco	DM15-E-430J
C55	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C56	Cap, 5PF, .5PF%, 500V Mica	1002-0028	Elmenco	DM15-C-050D
C57	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C58	Cap, 96PF, 1%, 500V Mica	1002-0049	Elmenco	DM15-F-960F
C59	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C60	Cap, 91PF, 5%, 500V Mica	1002-0027	Elmenco	DM15-F-910J
C61	Cap, 1.5PF, .25PF%, 500V Tub.	1005-0041	Erie	301-000-C0K0-159C
C62	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C63	Cap, 5PF, .5PF%, 500V Mica	1002-0028	Elmenco	DM15-C-050D
C64	Cap, 91PF, 5%, 500V Mica	1002-0027	Elmenco	DM15-F-910J
C65	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C66	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C67	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C68	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C69	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C70	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C71	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C72	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
	DIODES			
CR1	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR2	Diode, MPN3401	1281-0050	Motorola	MPN3401
CR3	Diode, MPN3401	1281-0050	Motorola	MPN3401
CR4	Diode, MPN3401	1281-0050	Motorola	MPN3401
CR5	Diode, MPN3401	1281-0050	Motorola	MPN3401
	CONNECTOR			
J1	Conn, SMB 50 Ohm Rtang Jk Pc Mt	2536-0060	Cablewave	700214NP
	INDUCTORS			
L1	Choke, 10μH, 10%	1585-0016	Delevan	1537-36
L2	Choke, 10μH, 10%	1585-0016	Delevan	1537-36
L3	Choke, 220μH, 5%	1585-0018	Delevan	1537-92
L4	Choke, 220μH, 5%	1585-0018	Delevan	1537-92
L5	Choke, 6.8μH, 10%	1585-0015	Delevan	1537-32
L6	Choke, 6.8μH, 10%	1585-0015	Delevan	1537-32
L7	Coil, Variable IF (3 turn)	1596-8102	Cushman	
L8	Coil, Variable IF (3 turn)	1596-8102	Cushman	
L9	Coil, Variable IF (3 turn)	1596-8102	Cushman	
L10	Choke, 1μH, 10%	1585-0027	Delevan	1537-12
L11	Choke, 6.8μH, 10%	1585-0015	Delevan	1537-32
	TRANSISTORS			
Q1	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q2	Trans, 2N4121	1272-0023	Fairchild	2N4121
Q3	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q4	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q5	Trans, 2N4275	1272-0016	Fairchild	2N4275

TCXO/REFERENCE DIVIDER, 3100 (cont)

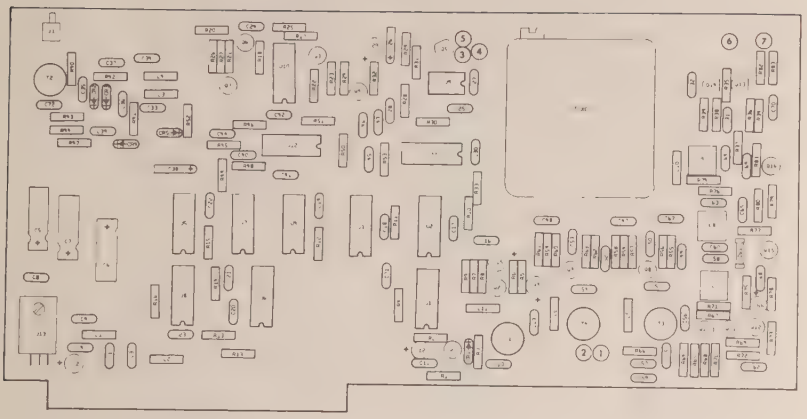
CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
Q6	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q7	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q8	Trans, 2N4121	1272-0023	Fairchild	2N4121
Q9	Trans, 2N4121	1272-0023	Fairchild	2N4121
Q10	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q11	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q12	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q13	Trans, 2N3904	1272-0032	Motorola	2N3904
Q14	Trans, 2N3904	1272-0032	Motorola	2N3904
Q15	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q16	Trans, 2N3563	1272-0022	Fairchild	2N3563
	RESISTORS			
R1	Res, 22K, 5%, 1/4W Comp	1066-2235	Allen-Bradley	CB2235
R2	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R3	Res, 200 Ohm, 5%, 1/4W Comp	1066-2015	Allen-Bradley	CB2015
R4	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R5	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R6	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R7	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R8	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R9	Res, 22K, 5%, 1/4W Comp	1066-2235	Allen-Bradley	CB2235
R10	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R11	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R12	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R13	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R14	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R15	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R16	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R17	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R18	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R19	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R20	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R21	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R22	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R23	Res, 910 Ohm, 5%, 1/4W Comp	1066-9115	Allen-Bradley	CB9115
R24	Res, 2.4K, 5%, 1/4W Comp	1066-2425	Allen-Bradley	CB2425
R25	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R26	Res, 6.2K, 5%, 1/4W Comp	1066-6225	Allen-Bradley	CB6225
R27	Res, 6.2K, 5%, 1/4W Comp	1066-6225	Allen-Bradley	CB6225
R28	Res, 150K, 1%, 100 PPM Film	1075-0152	Dale	MF 1/8
R29	Res, 100K, 1%, 1/8W MF	1075-0105	Dale	MF 1/8
R30	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R31	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R32	Res, 470 Ohm, 5%, 1/4W Comp	1066-4715	Allen-Bradley	CB4715
R33	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R34	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R35	Res, 330 Ohm, 5%, 1/4W Comp	1066-3315	Allen-Bradley	CB3315

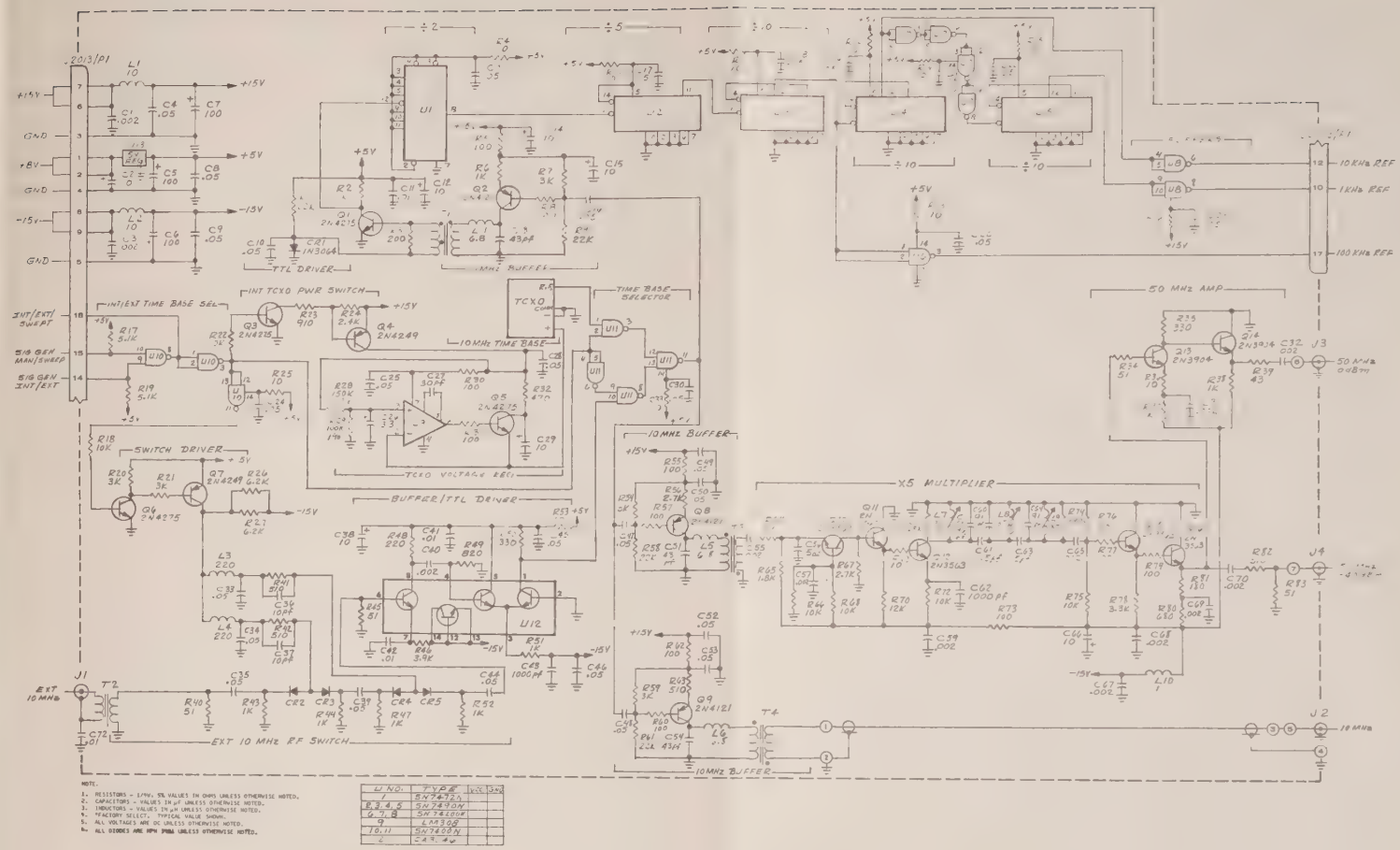
TCXO/REFERENCE DIVIDER, 3100 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R36	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R37	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R38	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R39	Res, 43 Ohm, 5%, 1/4W Comp	1066-4305	Allen-Bradley	CB4305
R40	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R41	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R42	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R43	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R44	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R45	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R46	Res, 3.9K, 5%, 1/4W Comp	1066-3925	Allen-Bradley	CB3925
R47	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R48	Res, 220 Ohm, 5%, 1/4W Comp	1066-2215	Allen-Bradley	CB2215
R49	Res, 820 Ohm, 5%, 1/4W Comp	1066-8215	Allen-Bradley	CB8215
R50	Res, 330 Ohm, 5%, 1/4W Comp	1066-3315	Allen-Bradley	CB3315
R51	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R52	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R53	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R54	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R55	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R56	Res, 2.7K, 5%, 1/4W Comp	1066-2725	Allen-Bradley	CB2725
R57	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R58	Res, 22K, 5%, 1/4W Comp	1066-2235	Allen-Bradley	CB2235
R59	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R60	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R61	Res, 22K, 5%, 1/4W Comp	1066-2235	Allen-Bradley	CB2235
R62	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R63	Res, 2.7K, 5%, 1/4W Comp	1066-2725	Allen-Bradley	CB2725
R64	Res, 39 Ohm, 5%, 1/4W Comp	1066-3905	Allen-Bradley	CB3905
R65	Res, 1.8K, 5%, 1/4W Comp	1066-1825	Allen-Bradley	CB1825
R66	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R67	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R68	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R69	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R70	Res, 12K, 5%, 1/4W Comp	1066-1235	Allen-Bradley	CB1235
R71	Res, 1.8K, 5%, 1/4W Comp	1066-1825	Allen-Bradley	CB1825
R72	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R73	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R74	Res, 390 Ohm, 5%, 1/4W Comp	1066-3915	Allen-Bradley	CB3915
R75	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R76	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R77	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R78	Res, 3.3K, 5%, 1/4W Comp	1066-3325	Allen-Bradley	CB3325
R79	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R80	Res, 680 Ohm, 5%, 1/4W Comp	1066-6815	Allen-Bradley	CB6815
R81	Res, 180 Ohm, 5%, 1/4W Comp	1066-1815	Allen-Bradley	CB1815
R82	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R83	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105

TCXO/REFERENCE DIVIDER, 3100 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
	TRANSFORMERS			
T1	Assy, Trifilar Coil	1579-0017	Cushman	
T2	Assy, Trifilar Coil	1579-0017	Cushman	
T3	Assy, Trifilar Coil	1579-0017	Cushman	
T4	Assy, Trifilar Coil	1579-0017	Cushman	
	INTEGRATED CIRCUITS			
U1	IC, SN7472N, TTL Dual Flip Flop	2025-0007	T.I.	SN7472N
U2	IC, SN7490N	2025-0002	T.I.	SN7490N
U3	IC, SN7490N	2025-0002	T.I.	SN7490N
U4	IC, SN7490N	2025-0002	T.I.	SN7490N
U5	IC, SN7490N	2025-0002	T.I.	SN7490N
U6	IC, SN74L00N	2025-0036	T.I.	SN74L00N
U7	IC, SN74L00N	2025-0036	T.I.	SN74L00N
U8	IC, SN74L00N	2025-0036	T.I.	SN74L00N
U9	IC, LM308N, Op Ampl 8 Pin	2025-0070	National	LM308N
U10	IC, SN7400N, TTL Nand Gates	2025-0003	T.I.	SN7400N
U11	IC, SN7400N, TTL Nand Gates	2025-0003	T.I.	SN7400N
U12	IC, CA3046 XSTR and D10 Array	2025-0171	RCA	CA3046
U13	IC, MC7805CP, 5V Pos Rgltr	2025-0088	Motorola	MC7805CP





NOTE:
1. RESISTORS - 1/4W, 5% VALUES IN OHMS UNLESS OTHERWISE NOTED.
2. CAPACITORS - VALUES IN pF UNLESS OTHERWISE NOTED.
3. INDUCTORS - VALUES IN μH UNLESS OTHERWISE NOTED.
4. *FACTORY SELECT; TYPICAL VALUE SHOWN.
5. ALL VOLTAGES ARE DC UNLESS OTHERWISE NOTED.
6. ALL DIODES ARE HPA 2800 UNLESS OTHERWISE NOTED.

U NO.	TYPE	Vcc	Sec
1	SN74121N		
2,3,4,5	SN7490N		
6,7,8	SN74L00N		
9	LM309K		
10,11	SN7400N		
12	CA3-4V		

5601**0066

Figure 3-11. TCXO/Reference Divider, 3100

PROGRAMMABLE DIVIDERS, 3200

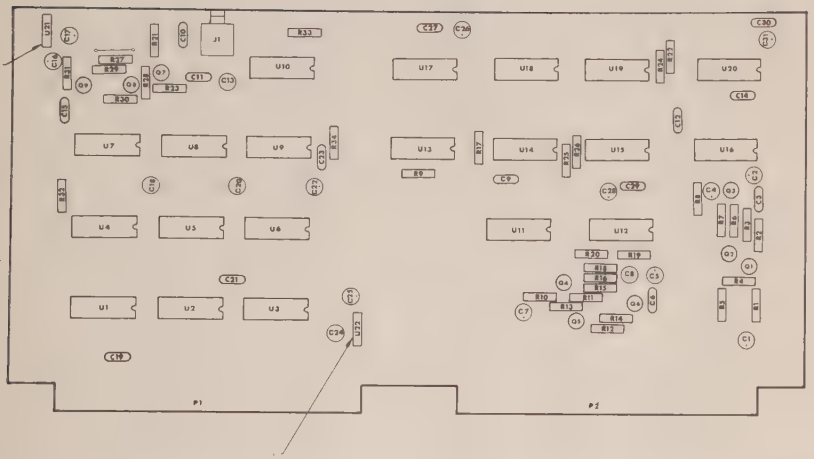
CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
3200	Assy, PC Bd. Programmable Dvdrs.	7001-0293	Cushman	
	PC Board	1780-0544	Cushman	
	CAPACITORS			
C1	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C2	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C3	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C4	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C5	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C6	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C7	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C8	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C9	Cap, 330PF, 5%, 500V Mica	1002-0032	Elmenco	DM15-F-331J
C10	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C11	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C12	Cap, 75PF, 5%, 500V Mica	1002-0025	Almenco	DM15-E-750J
C13	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C14	Cap, 91PF, 5%, 500V Mica	1002-0027	Elmenco	DM15-F-910J
C15	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C16	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C17	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C18	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C19	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C20	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C21	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C22	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C23	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C24	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C25	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C26	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C27	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C28	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C29	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C30	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C31	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
	TRANSISTORS			
Q1	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q2	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q3	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q4	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q5	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q6	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q7	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q8	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q9	Trans, 2N3563	1272-0022	Fairchild	2N3563

PROGRAMMABLE DIVIDERS, 3200 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
	RESISTORS			
R1	Res, 56 Ohm, 5%, 1/4W Comp	1066-5605	Allen-Bradley	CB5605
R2	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R3	Res, 470 Ohm, 5%, 1/4W Comp	1066-4715	Allen-Bradley	CB4715
R4	Res, 5.6K, 5%, 1/4W Comp	1066-5625	Allen-Bradley	CB5625
R5	Res, 180 Ohm, 5%, 1/4W Comp	1066-1815	Allen-Bradley	CB1815
R6	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R7	Res, 390 Ohm, 5%, 1/4W Comp	1066-3915	Allen-Bradley	CB3915
R8	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R9	Res, 3.3K, 5%, 1/4W Comp	1066-3325	Allen-Bradley	CB3325
R10	Res, 56 Ohm, 5%, 1/4W Comp	1066-5605	Allen-Bradley	CB5605
R11	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R12	Res, 470 Ohm, 5%, 1/4W Comp	1066-4715	Allen-Bradley	CB4715
R13	Res, 5.6K, 5%, 1/4W Comp	1066-5625	Allen-Bradley	CB5625
R14	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R15	Res, 180 Ohm, 5%, 1/4W Comp	1066-1815	Allen-Bradley	CB1815
R16	Res, 390 Ohm, 5%, 1/4W Comp	1066-3915	Allen-Bradley	CB3915
R17	Res, 3.3K, 5%, 1/4W Comp	1066-3325	Allen-Bradley	CB3325
R18	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R19	Res, 2.4K, 5%, 1/4W Comp	1066-2425	Allen-Bradley	CB2425
R20	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R21	Res, 56 Ohm, 5%, 1/4W Comp	1066-5605	Allen-Bradley	CB5605
R22	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R23	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R24	Res, 2.4K, 5%, 1/4W Comp	1066-2425	Allen-Bradley	CB2425
R25	Res, 2.4K, 5%, 1/4W Comp	1066-2425	Allen-Bradley	CB2425
R26	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R27	Res, 470 Ohm, 5%, 1/4W Comp	1066-4715	Allen-Bradley	CB4715
R28	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R29	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R30	Res, 180 Ohm, 5%, 1/4W Comp	1066-1815	Allen-Bradley	CB1815
R31	Res, 390 Ohm, 5%, 1/4W Comp	1066-3915	Allen-Bradley	CB3915
R32	Res, 2K, 5%, 1/4W Comp	1066-2025	Allen-Bradley	CB2025
R33	Res, 3.3K, 5%, 1/4W Comp	1066-3325	Allen-Bradley	CB3325
R34	Res, 3.3K, 5%, 1/4W Comp	1066-3325	Allen-Bradley	CB3325
	INTEGRATED CIRCUITS			
U1	IC, SN74L00N	2025-0036	T.I.	SN74L00N
U2	IC, SN74LS04N, Hex Inverter	2025-0084	T.I.	SN74LS04N
U3	IC, SN74S11N, Trpl 3-Input Pos & Gate	2025-0082	T.I.	SN74S11N
U4	IC, SN74L00N	2025-0036	T.I.	SN74L00N
U5	IC, SN74S04N, Hex Inverter	2025-0083	T.I.	SN74S04N
U6	IC, SN74L04N, Hex Inverter	2025-0038	T.I.	SN74L04N
U7	IC, SN74196N	2025-0016	T.I.	SN74196N
U8	IC, SN74196N	2025-0016	T.I.	SN74196N
U9	IC, SN74196N	2025-0016	T.I.	SN74196N
U10	IC, SN74S112N, Dual J-K Flip Flop	2025-0086	T.I.	SN74S112N

PROGRAMMABLE DIVIDERS, 3200 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
U11	IC, SN74L192N	2025-0081	T.I.	SN74L192N
U12	IC, SN74L192N	2025-0081	T.I.	SN74L192N
U13	IC, SN74LS11N, Triple 3-Input Pos AND Gate	2025-0109	T.I.	SN74LS11N
U14	IC, SN74LS73N, Dual J-K Flip Flop	2025-0110	T.I.	SN74LS73N
U15	IC, SN74LS08N, Quad 2-Input Pos AND Gate	2025-0087	T.I.	SN74LS08N
U16	IC, SN74LS32N, Quad 2-Input Pos OR Gate	2025-0085	T.I.	SN74LS32N
U17	IC, SN74LS196N, Decade Counters	2025-0111	T.I.	SN74LS196N
U18	IC, SN74LS196N, Decade Counters	2025-0111	T.I.	SN74LS196N
U19	IC, SN74LS196N, Decade Counters	2025-0111	T.I.	SN74LS196N
U20	IC, SN74LS73N, Dual J-K Flip Flop	2025-0110	T.I.	SN74LS73N
U21	IC, MC7805CP, 5V Pos Rgltr	2025-0088	Motorola	MC7805CP
U22	IC, MC7805CP, 5V Pos Rgltr	2025-0088	Motorola	MC7805CP



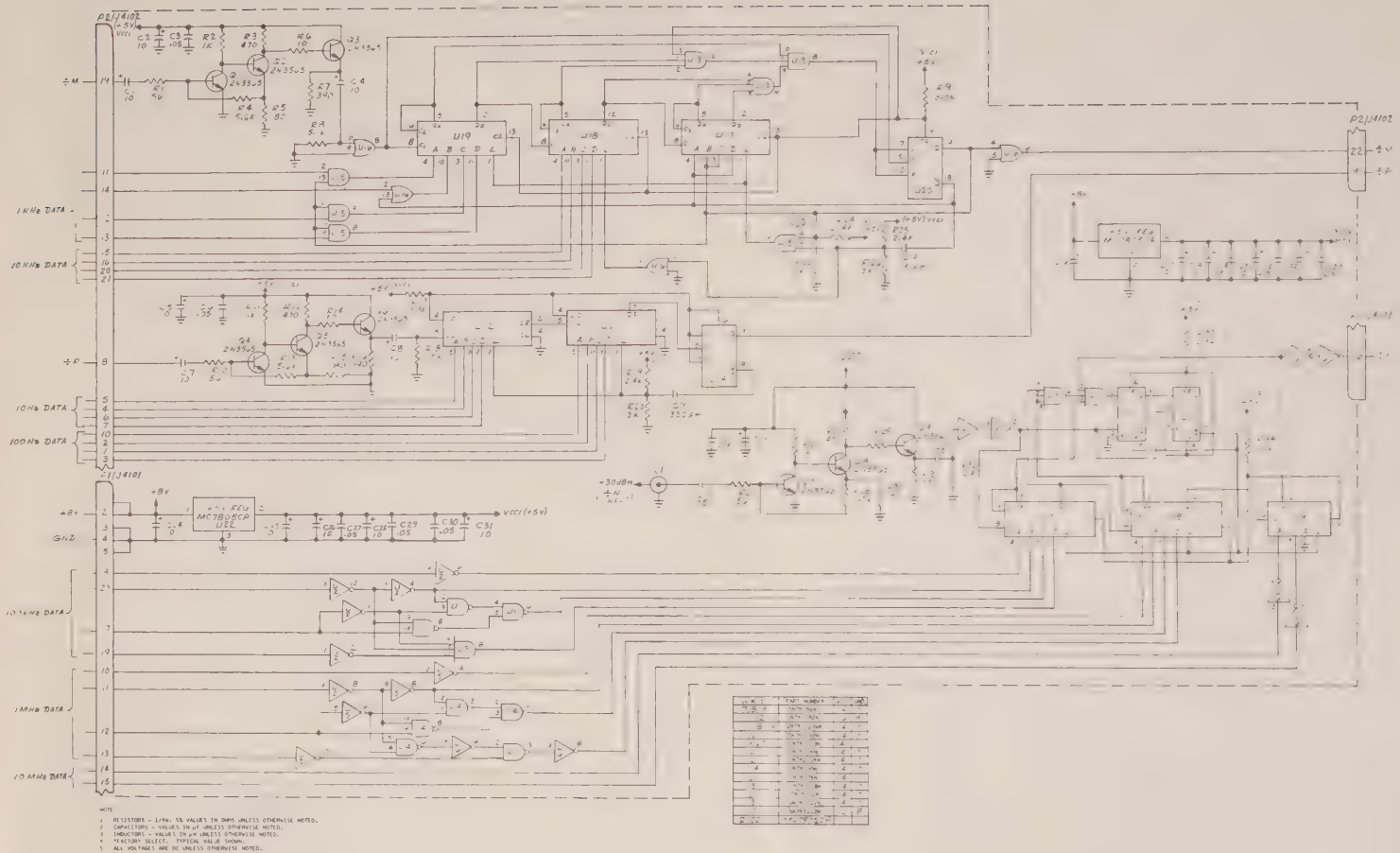


Figure 3-12. Programmable Dividers, 3200

LOW FREQUENCY PHASE LOCK LOOP, 3300

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
3300	Assy, PC Bd Low Freq PLL	7001-0292	Cushman	
	PC Board	1780-0543	Cushman	
	CAPACITORS			
C1	Cap, 47μF, 20%, 35V Tant	1011-0020	Kemet	T362D476M035AS
C2	Cap, 47μF, 20%, 35V Tant	1011-0020	Kemet	T362D476M035AS
C3	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C4	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C5	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C6	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C7	Cap, 47μF, 20%, 20V	1011-0009	Dickson	D47GSC20M
C8	Cap, 27PF, 5%, 500V Mica	1002-0008	Elmenco	DM15-E-270J
C9	Cap, 390PF, 5%, 500V Mica	1002-0033	Elmenco	DM15-F-391J
C10	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C11	Cap, 18PF, 5%, 500V Mica	1002-0014	Elmenco	DM15-C-180J
C12	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C13	Cap, 47μF, 20%, 35V Tant	1011-0020	Kemet	T362D476M035AS
C14	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C15	Cap, .1μF, 10%, 100V	1005-0064	Aerovox	CK06BX104K
C16	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C17	Cap, 47μF, 20%, 35V Tant	1011-0020	Kemet	T362D476M035AS
C18	Cap, 47μF, 20%, 35V Tant	1011-0020	Kemet	T362D476M035AS
C19	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C20	Cap, 300PF, 5%, 500V Mica	1002-0059	Elmenco	DM15-F-301J
C21	Cap, 430PF, 5%, 500V Mica	1002-0034	Elmenco	DM15-F-431J
C22	Cap, 300PF, 5%, 500V Mica	1002-0059	Elmenco	DM15-F-301J
C23	Cap, .1μF, 10%, 100V	1005-0064	Aerovox	CK06BX104K
C24	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C25	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C26	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C27	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C28	Cap, 200PF, 5%, 500V Mica	1002-0042	Elmenco	DM15-F-201J
C29	Cap, 620PF, 5%, 300V Mica	1002-0038	Elmenco	DM15-F-621J
C30	Cap, 82PF, 5%, 500V Mica	1002-0020	Elmenco	DM15-E-820J
C31	Cap, 680PF, 5%, 300V Mica	1002-0022	Elmenco	DM15-F-681J
C32	Cap, 470PF, 5%, 500V Mica	1002-0035	Elmenco	DM15-F-471J
C33	Cap, 2.2μF, 10%, 35V	1011-0001	Dickson	D2R2GSB35K
C34	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C35	Cap, 100PF, 5%, 500V Mica	1002-0011	Elmenco	DM15-F-101J
C36	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C37	Cap, .1μF, 10%, 100V	1005-0064	Aerovox	CK06BX104K
C38	Cap, 270PF, 5%, 500V Mica	1002-0031	Elmenco	DM15-F-271J
C39	Cap, 47μF, 20%, 35V Tant	1011-0020	Kemet	T362D476M035AS
C40	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C41	Cap, 43PF, 5%, 500V Mica	1002-0046	Elmenco	DM15-E-430J
C42	Cap, 150PF, 5%, 500V Mica	1002-0021	Elmenco	DM15-F-151J
C43	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C44	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C45	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z

LOW FREQUENCY PHASE LOCK LOOP, 3300 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
C46	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C47	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C48	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C49	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C50	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C51	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C52	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C53	Cap, .01μF, 10%, 200V	1005-0065	Aerovox	CK06BX103K
C54	Cap, .1μF, 10%, 100V	1005-0064	Aerovox	CK06BX104K
C55	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C56	Cap, .1μF, 10%, 100V	1005-0064	Aerovox	CK06BX104K
C57	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C58	Cap, .01μF, 10%, 200V	1005-0065	Aerovox	CK06BX103K
C59	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C60	Cap, 100PF, 5%, 500V Mica	1002-0011	Elmenco	DM15-F-101J
C61	Cap, .0027μF, 10%, 100V	1008-0009	Sprague	225P27291WA3
C62	Cap, .0027μF, 10%, 100V	1008-0009	Sprague	225P27291WA3
C63	Cap, .0056μF, 10%, 100V	1008-0022	Sprague	225P56291WA3
C64	Cap, .39μF, 10%, 200V	1008-0037	Electrocube	625B1C394K2
C65	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C66	Cap, 100PF, 5%, 500V Mica	1002-0011	Elmenco	DM15-F-101K
C67	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C68	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C69	Cap, .039μF, 10%, 100V	1008-0045	Sprague	225P39391WA3
C70	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C71	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C72	Cap, 120PF, 5%, 500V Mica	1002-0010	Elmenco	DM15-F-121J
C73	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C74	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C75	Cap, 27PF, 5%, 500V Mica	1002-0008	Elmenco	DM15-E-270J
C76	Cap, 270PF, 5%, 500V Mica	1002-0031	Elmenco	DM15-F-271J
C77	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C78	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C79	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C80	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C81	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C82	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C83	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C84	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C85	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C86	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C87	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C88	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C89	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C90	Cap, 560PF, 5%, 300V Mica	1002-0037	Elmenco	DM15-F-561J
C91	Cap, 1100PF, 5%, 500V Mica	1002-0071	Elmenco	DM19-F-112J
C92	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C93	Cap, 47μF, 20%, 20V	1011-0009	Dickson	D47GSC20M
C94	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C95	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z

LOW FREQUENCY PHASE LOCK LOOP, 3300 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
C96	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C97	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C98	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C99	Cap, .1μF, 10%, 100V	1005-0064	Aerovox	CK06BX104K
C100	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C101	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C102	Cap, .01μF, 10%, 200V	1005-0065	Aerovox	CK06BX103K
C103	Cap, .1μF, 10%, 100V	1005-0064	Aerovox	CK06BX104K
C104	Cap, .1μF, 10%, 100V	1005-0064	Aerovox	CK06BX104K
C105	Cap, .01μF, 10%, 200V	1005-0065	Aerovox	CK06BX103K
C106	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C107	Cap, .01μF, 10%, 200V	1005-0065	Aerovox	CK06BX103K
C108	Cap, .01μF, 10%, 200V	1005-0065	Aerovox	CK06BX103K
C109	Cap, .01μF, 10%, 200V	1005-0065	Aerovox	CK06BX103K
C110	Cap, .01μF, 10%, 200V	1005-0065	Aerovox	CK06BX103K
C111	Cap, 47μF, 20%, 20V	1011-0009	Dickson	D47GSC20M
C112	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C113	Cap, 100PF, 5%, 500V Mica	1002-0011	Elmenco	DM15-F-101J
C114	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C115	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C116	Cap, .39μF, 10%, 200V	1008-0037	Electrocube	625B1C394K2
C117	Cap, 270PF, 5%, 500V Mica	1002-0031	Elmenco	DM15-F-271J
	DIODES			
CR1	Diode, MV109, Varicap 29PF 30V.4W Si	1281-0064	Motorola	MV109
CR2	Diode, MV109, Varicap 29PF 30V.4W Si	1281-0064	Motorola	MV109
CR3	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR4	Diode, G633	1282-0005	ITT	G633
CR5	Diode, G633	1282-0005	ITT	G633
CR6	Diode, G633	1282-0005	ITT	G633
CR7	Diode, G633	1282-0005	ITT	G633
CR8	Diode, MV109, Varicap 29PF 30V.4W Si	1281-0064	Motorola	MV109
CR9	Diode, MV109, Varicap 29PF 30V.4W Si	1281-0064	Motorola	MV109
CR10	Not Used			
CR11	Diode, MV109, Varicap 29PF 30V.4W Si	1281-0064	Motorola	MV109
CR12	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR13	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR14	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR15	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR16	Diode, 1N3064	1281-0013	Teledyne	1N3064
	CONNECTOR			
J1	Conn, SMB 50 Ohm Rtang Jk Pc Mt Snap-on	2536-0060	Cablewave	700214NP

LOW FREQUENCY PHASE LOCK LOOP, 3300 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
	INDUCTORS			
L1	Choke, 1000μH, 5%	1585-0020	Delevan	2500-28
L2	Choke, 1000μH, 5%	1585-0020	Delevan	2500-28
L3	Choke, 1000μH, 5%	1585-0020	Delevan	2500-28
L4	Choke, 1000μH, 5%	1585-0020	Delevan	2500-28
L5	Choke, 1000μH, 5%	1585-0020	Delevan	2500-28
L6	Choke, 1000μH, 5%	1585-0020	Delevan	2500-28
L7	Coil, Variable IF	1596-0219	Cushman	
L8	Choke, 47MH	1585-0044	Cambion	3635-57
L9	Choke, 4700μH, 5%	1585-0006	Delevan	2500-60
L10	Choke, 4700μH, 5%	1585-0006	Delevan	2500-60
L11	Choke, 1.2μH, 10% RF Molded	1585-0066	Delevan	1534-14
L12	Choke, 1.5μH, 10%	1585-0038	Delevan	1537-16
L13	Coil, Variable IF (18 turn)	1596-0216	Cushman	
L14	Choke, 1000μH, 5%	1585-0020	Delevan	2500-28
L15	Coil, 2.4μH, 5%	1596-0056	Dale	1DY-1041-33
L16	Choke, 56μH, 5% RF	1585-0042	Delevan	1537-64
L17	Choke, 220μH, 5%	1585-0018	Delevan	1537-92
L18	Choke, 3.3μH, 10%	1585-0037	Delevan	1537-24
L19	Choke, 2.7μH, 10%	1585-0049	Delevan	1537-22
L20	Choke, 220μH, 5%	1585-0018	Delevan	1537-92
L21	Choke, 680μH, 5%	1585-0023	Delevan	2500-20
	TRANSISTORS			
Q1	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q2	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q3	Trans, 2N4416	1272-0048	National	2N4416
Q4	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q5	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q6	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q7	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q8	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q9	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q10	Trans, 2N5179 (RCA)	1272-0067	RCA	2N5179
Q11	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q12	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q13	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q14	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q15	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q16	Trans, 2N5962	1272-0059	Fairchild	2N5962
Q17	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q18	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q19	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q20	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q21	Trans, 2N5179 (RCA)	1272-0067	RCA	2N5179
Q22	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q23	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q24	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q25	Trans, 2N3565	1272-0017	Fairchild	2N3565

LOW FREQUENCY PHASE LOCK LOOP, 3300 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
Q26	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q27	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q28	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q29	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q30	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q31	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q32	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q33	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q34	Trans, 2N3565	1272-0017	Fairchild	2N3565
	RESISTORS			
R1	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R2	Res, 3.3K, 5%, 1/4W Comp	1066-3325	Allen-Bradley	CB3325
R3	Res, 33K, 5%, 1/4W Comp	1066-3335	Allen-Bradley	CB3335
R4	Res, 330K, 5%, 1/4W Comp	1066-3345	Allen-Bradley	CB3345
R5	Res, 330K, 5%, 1/4W Comp	1066-3345	Allen-Bradley	CB3345
R6	Res, 5.6M, 5%, 1/4W Comp	1066-5655	Allen-Bradley	CB5655
R7	Res, 5.6M, 5%, 1/4W Comp	1066-5655	Allen-Bradley	CB5655
R8	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R9	Res, 220 Ohm, 5%, 1/4W Comp	1066-2215	Allen-Bradley	CB2215
R10	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R11	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R12	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R13	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R14	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R15	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R16	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R17	Res, 12K, 5%, 1/4W Comp	1066-1235	Allen-Bradley	CB1235
R18	Res, 220 Ohm, 5%, 1/4W Comp	1066-2215	Allen-Bradley	CB2215
R19	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R20	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R21	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R22	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R23	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R24	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R25	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R26	Res, 220 Ohm, 5%, 1/4W Comp	1066-2215	Allen-Bradley	CB2215
R27	Res, 22K, 5%, 1/4W Comp	1066-2235	Allen-Bradley	CB2235
R28	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R29	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R30	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R31	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R32	Res, 200 Ohm, 5%, 1/4W Comp	1066-2015	Allen-Bradley	CB2015
R33	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R34	Res, 180 Ohm, 5%, 1/4W Comp	1066-1815	Allen-Bradley	CB1815
R35	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R36	Res, 27K, 5%, 1/4W Comp	1066-2735	Allen-Bradley	CB2735
R37	Res, 120K, 5%, 1/4W Comp	1066-1245	Allen-Bradley	CB1245
R38	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R39	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R40	Res, 120 Ohm, 5%, 1/4W Comp	1066-1215	Allen-Bradley	CB1215

LOW FREQUENCY PHASE LOCK LOOP, 3300

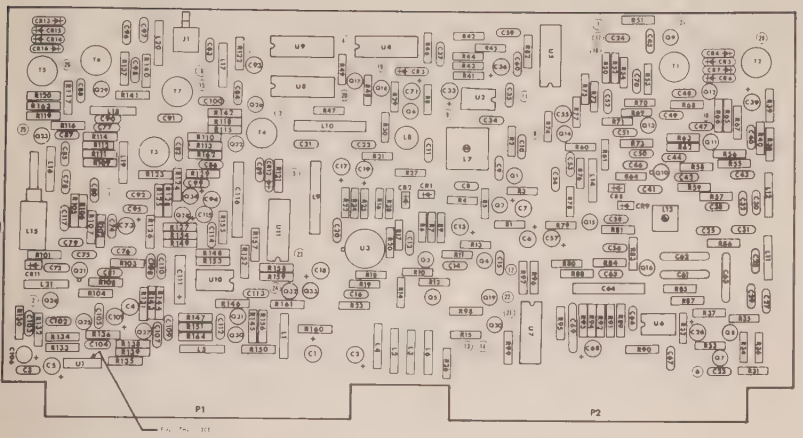
CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R41	Res, 2K, 5%, 1/4W Comp	1066-2025	Allen-Bradley	CB2025
R42	Res, 2K, 5%, 1/4W Comp	1066-2025	Allen-Bradley	CB2025
R43	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R44	Res, 68K, 5%, 1/4W Comp	1066-6835	Allen-Bradley	CB6835
R45	Res, 18K, 5%, 1/4W Comp	1066-1835	Allen-Bradley	CB1835
R46	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R47	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R48	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R49	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R50	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R51	Res, 27 Ohm, 5%, 1/4W Comp	1066-2705	Allen-Bradley	CB2705
R52	Res, 8.2K, 5%, 1/4W Comp	1066-8225	Allen-Bradley	CB8225
R53	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R54	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R55	Res, 220 Ohm, 5%, 1/4W Comp	1066-2215	Allen-Bradley	CB2215
R56	Res, 470 Ohm, 5%, 1/4W Comp	1066-4715	Allen-Bradley	CB4715
R57	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R58	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R59	Res, 4.7K, 5%, 1/4W Comp	1066-4725	Allen-Bradley	CB4725
R60	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R61	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R62	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R63	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R64	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R65	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R66	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R67	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R68	Res, 560 Ohm, 5%, 1/4W Comp	1066-5615	Allen-Bradley	CB5615
R69	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R70	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R71	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R72	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R73	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R74	Res, 20K, 5%, 1/4W Comp	1066-2035	Allen-Bradley	CB2035
R75	Res, 470 Ohm, 5%, 1/4W Comp	1066-4715	Allen-Bradley	CB4715
R76	Res, 1.2K, 5%, 1/4W Comp	1066-1225	Allen-Bradley	CB1225
R77	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R78	Res, 1.2K, 5%, 1/4W Comp	1066-1225	Allen-Bradley	CB1225
R79	Res, 20K, 5%, 1/4W Comp	1066-2035	Allen-Bradley	CB2035
R80	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R81	Res, 1.6K, 5%, 1/4W Comp	1066-1625	Allen-Bradley	CB1625
R82	Res, 12K, 5%, 1/4W Comp	1066-1235	Allen-Bradley	CB1235
R83	Res, 1.6K, 5%, 1/4W Comp	1066-1625	Allen-Bradley	CB1625
R84	Res, 20K, 5%, 1/4W Comp	1066-2035	Allen-Bradley	CB2035
R85	Res, 5.6K, 5%, 1/4W Comp	1066-5625	Allen-Bradley	CB5625
R86	Res, 2.7K, 5%, 1/4W Comp	1066-2725	Allen-Bradley	CB2725
R87	Res, 5.6K, 5%, 1/4W Comp	1066-5625	Allen-Bradley	CB5625
R88	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R89	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R90	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025

LOW FREQUENCY PHASE LOCK LOOP, 3300 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R91	Res, 750K, 5%, 1/4W Comp	1066-7545	Allen-Bradley	CB7545
R92	Res, 430 Ohm, 5%, 1/4W Comp	1066-4315	Allen-Bradley	CB4315
R93	Res, 18K, 5%, 1/4W Comp	1066-1835	Allen-Bradley	CB1835
R94	Res, 2K, 5%, 1/4W Comp	1066-2025	Allen-Bradley	CB2025
R95	Res, 430 Ohm, 5%, 1/4W Comp	1066-4315	Allen-Bradley	CB4315
R96	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R97	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R98	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R99	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R100	Not Used			
R101	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R102	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R103	Res, 4.7K, 5%, 1/4W Comp	1066-4725	Allen-Bradley	CB4725
R104	Res, 220 Ohm, 5%, 1/4W Comp	1066-2215	Allen-Bradley	CB2215
R105	Res, 220 Ohm, 5%, 1/4W Comp	1066-2215	Allen-Bradley	CB2215
R106	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R107	Res, 180 Ohm, 5%, 1/4W Comp	1066-1815	Allen-Bradley	CB1815
R108	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R109	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R110	Res, 27 Ohm, 5%, 1/4W Comp	1066-2705	Allen-Bradley	CB2705
R111	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R112	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R113	Res, 2.7K, 5%, 1/4W Comp	1066-2725	Allen-Bradley	CB2725
R114	Res, 3.3K, 5%, 1/4W Comp	1066-3325	Allen-Bradley	CB3325
R115	Res, 12K, 5%, 1/4W Comp	1066-1235	Allen-Bradley	CB1235
R116	Res, 12K, 5%, 1/4W Comp	1066-1235	Allen-Bradley	CB1235
R117	Res, 18K, 5%, 1/4W Comp	1066-1835	Allen-Bradley	CB1835
R118	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R119	Res, 120 Ohm, 5%, 1/4W Comp	1066-1215	Allen-Bradley	CB1215
R120	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R121	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R122	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R123	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R124	Res, 6.8K, 5%, 1/4W Comp	1066-6825	Allen-Bradley	CB6825
R125	Res, 120K, 5%, 1/4W Comp	1066-1245	Allen-Bradley	CB1245
R126	Res, 27K, 5%, 1/4W Comp	1066-2735	Allen-Bradley	CB2735
R127	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R128	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R129	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R130	Res, 20K, 5%, 1/4W Comp	1066-2035	Allen-Bradley	CB2035
R131	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R132	Res, 7.5K, 5%, 1/4W Comp	1066-7525	Allen-Bradley	CB7525
R133	Res, 7.5K, 5%, 1/4W Comp	1066-7525	Allen-Bradley	CB7525
R134	Res, 20K, 5%, 1/4W Comp	1066-2035	Allen-Bradley	CB2035
R135	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R136	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R137	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R138	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R139	Res, 20K, 5%, 1/4W Comp	1066-2035	Allen-Bradley	CB2035
R140	Res, 12K, 5%, 1/4W Comp	1066-1235	Allen-Bradley	CB1235

LOW FREQUENCY PHASE LOCK LOOP, 3300 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R141	Res, 27 Ohm, 5%, 1/4W Comp	1066-2705	Allen-Bradley	CB2705
R142	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R143	Res, 16K, 5%, 1/4W Comp	1066-1635	Allen-Bradley	CB1635
R144	Res, 16K, 5%, 1/4W Comp	1066-1635	Allen-Bradley	CB1635
R145	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R146	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R147	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R148	Res, 620 Ohm, 5%, 1/4W Comp	1066-6215	Allen-Bradley	CB6215
R149	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R150	Res, 3.3K, 5%, 1/4W Comp	1066-3325	Allen-Bradley	CB3325
R151	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R152	Res, 240 Ohm, 5%, 1/4W Comp	1066-2415	Allen-Bradley	CB2415
R153	Res, 1 Meg, 5%, 1/4W Comp	1066-1055	Allen-Bradley	CB1055
R154	Res, 18K, 5%, 1/4W Comp	1066-1835	Allen-Bradley	CB1835
R155	Res, 2K, 5%, 1/4W Comp	1066-2025	Allen-Bradley	CB2025
R156	Res, 3.9K, 5%, 1/4W Comp	1066-3925	Allen-Bradley	CB3925
R157	Res, 240 Ohm, 5%, 1/4W Comp	1066-2415	Allen-Bradley	CB2415
R158	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R159	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R160	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R161	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R162	Res, 12K, 5%, 1/4W Comp	1066-1235	Allen-Bradley	CB1235
R163	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R164	Res, 8.2K, 5%, 1/4W Comp	1066-8225	Allen-Bradley	CB8225
	TRANSFORMERS			
T1	Assy, Trifilar Coil	1579-0017	Cushman	
T2	Assy, Trifilar Coil	1579-0017	Cushman	
T3	Assy, Trifilar Coil	1579-0017	Cushman	
T4	Assy, Trifilar Coil	1579-0017	Cushman	
T5	Assy, Trifilar Coil	1579-0017	Cushman	
T6	Assy, Trifilar Coil	1579-0017	Cushman	
T7	Assy, Trifilar Coil	1579-0017	Cushman	
	INTEGRATED CIRCUITS			
U1	IC, MC7805CP, 5V Pos Rgltr	2025-0088	Motorola	MC7805CP
U2	IC, LM308N, Op Ampl 8 Pin	2025-0070	National	LM308N
U3	IC, MC1496 Bal Mod-Demod	2025-0112	Motorola	MC1496
U4	IC, MC4044P Phase Detector	2025-0066	Motorola	MC4044P
U5	IC, SN7490N	2025-0002	T.I.	SN7490N
U6	IC, LM308N Op Ampl 8 Pin	2025-0070	National	LM308N
U7	IC, MC4044P Phase Detector	2025-0066	Motorola	MC4044P
U8	IC, SN7490N	2025-0002	T.I.	SN7490N
U9	IC, SN7490N	2025-0002	T.I.	SN7490N
U10	IC, LM308N Op Ampl 8 Pin	2025-0070	National	LM308N
U11	IC, MC4044P Phase Detector	2025-0066	Motorola	MC4044P



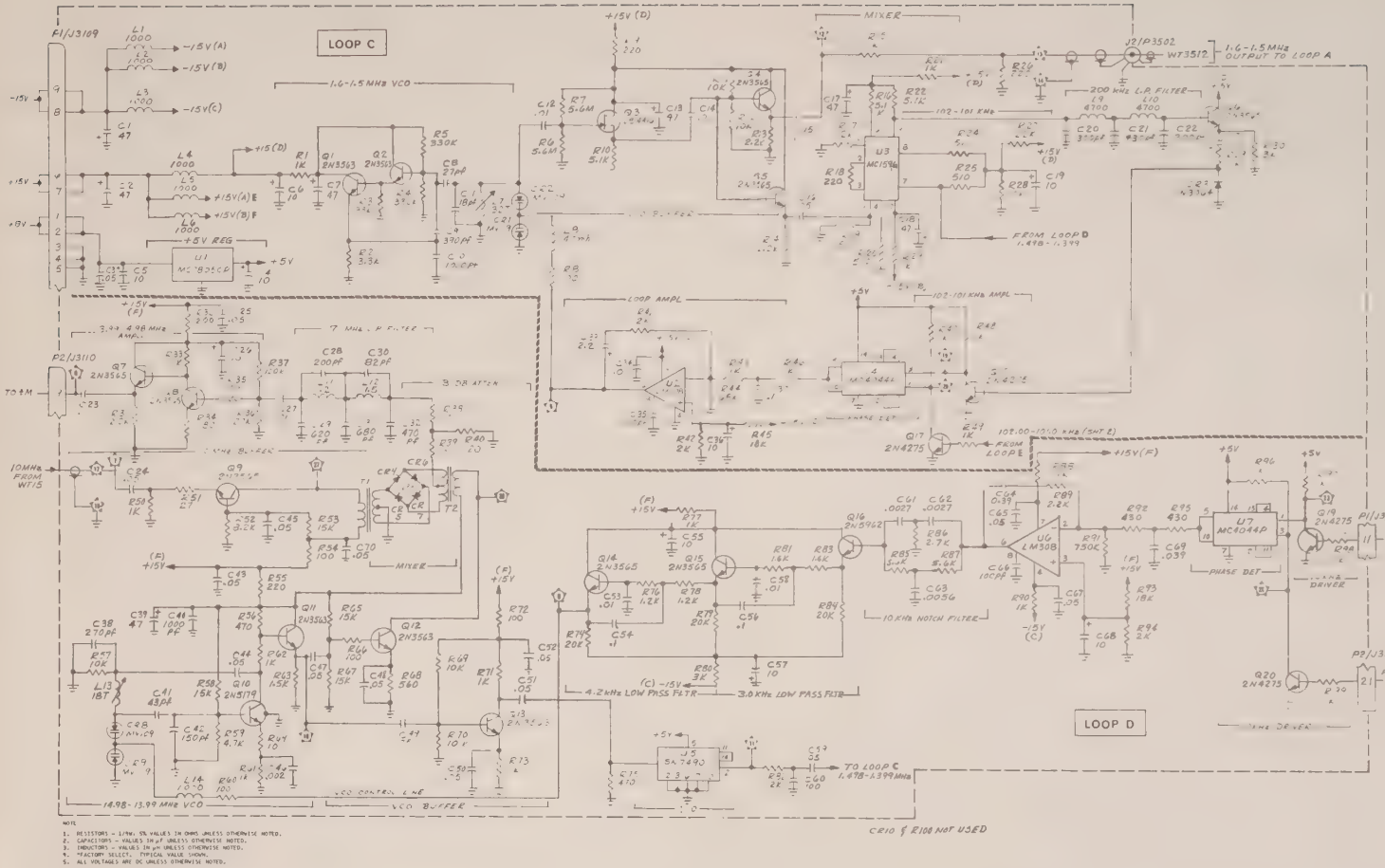
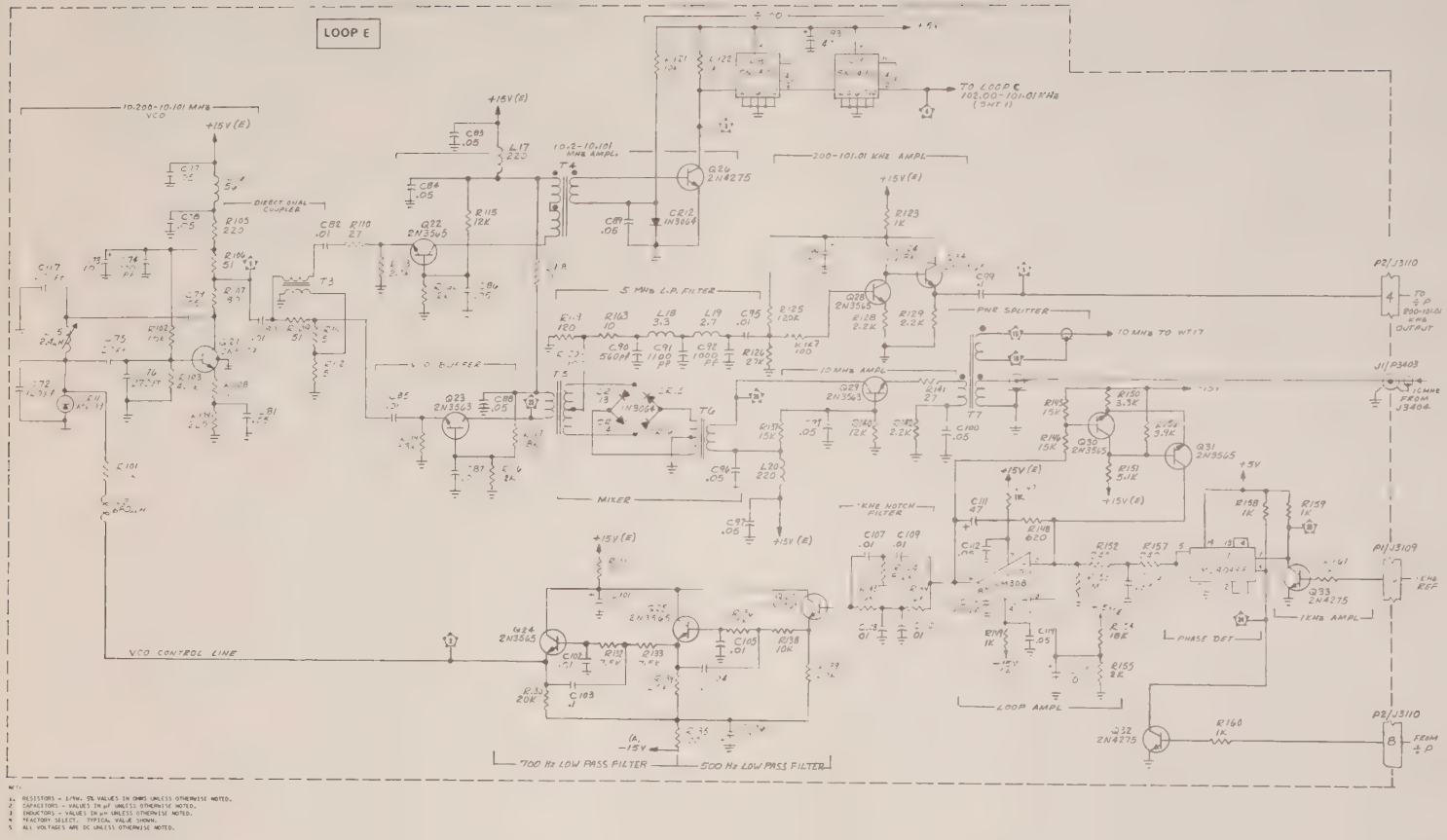


Figure 3-13. Low Frequency Phase Lock Loop, 3300, sheet 1

5601**0066



NOTES:
1. RESISTORS - 1/4W, 5% VALUES IN OHMS UNLESS OTHERWISE NOTED.
2. CAPACITORS - VALUES IN μF UNLESS OTHERWISE NOTED.
3. INDUCTORS - VALUES IN μH UNLESS OTHERWISE NOTED.
4. *FACTORY SELECT. TYPICAL VALUE SHOWN.
5. ALL VOLTAGES ARE DC UNLESS OTHERWISE NOTED.

Figure 3-14. Low Frequency Phase Lock Loop, 3300, sheet 2

5601**0066

HIGH FREQUENCY PHASE LOCK LOOP, 3400

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
3400	PCB Assy, High Freq PLL	7001-0411	Cushman	
	PC Board	1780-0541	Cushman	
	CAPACITORS			
C1	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C2	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C3	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C4	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C5	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C6	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C7	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C8	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C9	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C10	Cap, 87PF, 1%, 500V Mica	1002-0047	Elmenco	DM15-E-870F
C11	Cap, 220PF, 5%, 500V Mica	1002-0029	Elmenco	DM15-F-221J
C12	Cap, .0022μF, 10%, 100V	1008-0020	Sprague	225P22291WA3
C13	Cap, .022μF, 10%, 100V	1008-0034	Sprague	225P22391WA3
C14	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C15	Cap, 87PF, 1%, 500V Mica	1002-0047	Elmenco	DM15-E-870F
C16	Cap, .39μF, 10%, 200V	1008-0037	Electrocube	625B1C394K2
C17	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C18	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C19	Cap, 30PF, 5%, 500V Mica	1002-0043	Elmenco	DM15-E-300J
C20	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C21	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C22	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C23	Cap, 56PF, 5%, 500V Mica	1002-0019	Elmenco	DM15-E-560J
C24	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C25	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C26	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C27	Cap, 470PF, 5%, 500V Mica	1002-0035	Elmenco	DM15-F-471J
C28	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C29	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C30	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C31	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C32	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C33	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C34	Cap, 5PF, .5PF%, 500V Mica	1002-0028	Elmenco	DM15-C-050D
C35	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C36	Cap, 5PF, .5PF%, 500V Mica	1002-0028	Elmenco	DM15-C-050D
C37	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C38	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C39	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C40	Cap, 300PF, 5%, 500V Mica	1002-0059	Elmenco	DM15-F-301J
C41	Cap, 300PF, 5%, 500V Mica	1002-0059	Elmenco	DM15-F-301J
C42	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C43	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C44	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C45	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J

HIGH FREQUENCY PHASE LOCK LOOP, 3400 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
C46	Cap, 56PF, 5%, 500V Mica	1002-0019	Elmenco	DM15-E-560J
C47	Cap, 56PF, 5%, 500V Mica	1002-0019	Elmenco	DM15-E-560J
C48	Cap, 10PF, 5%, 500V Mica	1002-0016	Elmenco	DM15-C-100J
C49	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C50	Cap, 10PF, 5%, 500V Mica	1002-0016	Elmenco	DM15-C-100J
C51	Cap, 120PF, 5%, 500V Mica	1002-0010	Elmenco	DM15-F-121J
C52	Cap, 120PF, 5%, 500V Mica	1002-0010	Elmenco	DM15-F-121J
C53	Cap, 120PF, 5%, 500V Mica	1002-0010	Elmenco	DM15-F-121J
C54	Cap, 120PF, 5%, 500V Mica	1002-0010	Elmenco	DM15-F-121J
C55	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C56	Not Used			
C57	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C58	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C59	Not Used			
C60	Not Used			
C61	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C62	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C63	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C64	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C65	Cap, 30PF, 5%, 500V Mica	1002-0043	Elmenco	DM15-E-300J
C66	Cap, .1μF, 10%, 100V	1008-0031	Sprague	225P10491WA3
C67	Cap, 300PF, 5%, 500V Mica	1002-0059	Elmenco	DM15-F-301J
C68	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C69	Cap, 560PF, 5%, 300V Mica	1002-0037	Elmenco	DM15-F-561J
C70	Cap, 680PF, 5%, 300V Mica	1002-0022	Elmenco	DM15-F-681J
C71	Cap, 2400PF, 5%, 500V Mica	1002-0074	Elmenco	DM19-F-242J
C72	Cap, 3000PF, 5%, 500V Dip Mica	1002-0088	Elmenco	DM19-F-302J
C73	Cap, 3000PF, 5%, 500V Dip Mica	1002-0088	Elmenco	DM19-F-302J
C74	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C75	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C76	Cap, 120PF, 5%, 500V Mica	1002-0010	Elmenco	DM15-F-121J
C77	Cap, 120PF, 5%, 500V Mica	1002-0010	Elmenco	DM15-F-121J
C78	Cap, 120PF, 5%, 500V Mica	1002-0010	Elmenco	DM15-F-121J
C79	Cap, 120PF, 5%, 500V Mica	1002-0010	Elmenco	DM15-F-121J
C80	Cap, 10PF, 5%, 500V Mica	1002-0016	Elmenco	DM15-C-100J
C81	Cap, 56PF, 5%, 500V Mica	1002-0019	Elmenco	DM15-E-560J
C82	Cap, 10PF, 5%, 500V Mica	1002-0016	Elmenco	DM15-C-100J
C83	Cap, 56PF, 5%, 500V Mica	1002-0019	Elmenco	DM15-E-560J
C84	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C85	Cap, 300PF, 5%, 500V Mica	1002-0059	Elmenco	DM15-F-301J
C86	Cap, 300PF, 5%, 500V Mica	1002-0059	Elmenco	DM15-F-391J
C87	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C88	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C89	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C90	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C91	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C92	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C93	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C94	Cap, 5PF, .5PF%, 500V Mica	1002-0028	Elmenco	DM15-C-050D
C95	Cap, 5PF, .5PF%, 500V Mica	1002-0028	Elmenco	DM15-C-050D

HIGH FREQUENCY PHASE LOCK LOOP, 3400 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
C96	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C97	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C98	Cap, 5PF, .5PF%, 500V Mica	1002-0028	Elmenco	DM15-C-050D
C99	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C100	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C101	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C102	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C103	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C104	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C105	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C106	Cap, 18PF, 5%, 500V Mica	1002-0014	Elmenco	DM15-C-180J
C107	Cap, 12PF, 5%, 500V Mica	1002-0017	Elmenco	DM15-C-120J
C108	Cap, 110PF, 5%, 500V Mica	1002-0026	Elmenco	DM15-F-111J
C109	Cap, 36PF, 5%, 500V Mica	1002-0041	Elmenco	DM15-E-360J
C110	Cap, 180PF, 5%, 500V Mica	1002-0005	Elmenco	DM15-F-181J
C111	Cap, 96PF, 1%, 500V Mica	1002-0049	Elmenco	DM15-F-960F
C112	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
	DIODES			
CR1	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR2	Diode, HPA2800	1283-0001	HPA	5082-2800
CR3	Diode, HPA2800	1283-0001	HPA	5082-2800
CR4	Diode, HPA2800	1283-0001	HPA	5082-2800
CR5	Diode, HPA2800	1283-0001	HPA	5082-2800
CR6	Diode, MV109, Varicap 29PF 30V.4W Si	1281-0064	Motorola	MV109
CR7	Diode, MV109, Varicap 29PF 30V.4W Si	1281-0064	Motorola	MV108
CR8	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR9	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR10	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR11	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR12	Diode, MV109, Varicap 29PF 30V.4W Si	1281-0064	Motorola	MV109
CR13	Diode, MV109, Varicap 29PF 30V.4W Si	1281-0064	Motorola	MV109
CR14	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR15	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR16	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR17	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR18	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR19	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR20	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR21	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR22	Diode, HPA2800	1283-0001	HPA	5082-2800
CR23	Diode, HPA2800	1283-0001	HPA	5082-2800
CR24	Diode, HPA2800	1283-0001	HPA	5082-2800
CR25	Diode, HPA2800	1283-0001	HPA	5082-2800

HIGH FREQUENCY PHASE LOCK LOOP, 3400 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
	CONNECTORS			
J1	Not Used			
J2	Conn, SMB 50 Ohm Rtang Jk Pc Mt Snap-on	2536-0060	Cablewave	700214NP
J3	Conn, SMB 50 Ohm Jk Rec Bhd Mt	2536-0082	Sealectro	51-049-0000
J4	Conn, SMB 50 Ohm Rtang Jk Pc Mt Snap-on	2536-0060	Cablewave	700214NP
	INDUCTORS			
L1	Choke, 1000μH, 5%	1585-0020	Delevan	2500-28
L2	Choke, 1000μH, 5%	1585-0020	Delevan	2500-28
L3	Choke, 56μH, 5% RF	1585-0042	Delevan	1537-64
L4	Choke, 2 1/2 Turns, Wide Band	1586-0003	VK	20020/4B
L5	Choke, 10μH, 10%	1585-0016	Delevan	1537-32
L6	Choke, 10μH, 10%	1585-0016	Delevan	1537-32
L7	Choke, U-250 Ferrite Bead	1586-0004	Ferroxcube	56-590-65/4B
L8	Choke, 56μH, 5% RF	1585-0042	Delevan	1537-64
L9	Coil, Variable IF (6 turn)	1596-8104	Cushman	
L10	Coil, Variable IF (5 turn)	1596-8103	Cushman	
L11	Choke, 10μH, 10%	1585-0016	Delevan	1537-32
L12	Choke, 10μH, 10%	1585-0016	Delevan	1537-32
L13	Choke, 1000μH, 5%	1585-0020	Delevan	2500-28
L14	Coil, Variable IF (330 turn)	1596-0214	Cushman	
L15	Coil, Variable IF (330 turn)	1596-0214	Cushman	
L16	Coil, Variable IF (330 turn)	1596-0214	Cushman	
L17	Coil, Variable IF (6 turn)	1596-8104	Cushman	
L18	Choke, 10μH, 10%	1585-0016	Delevan	1537-32
L19	Coil, Variable IF (5 turn)	1596-8103	Cushman	
L20	Choke, 10μH, 10%	1585-0016	Delevan	1537-32
L21	Choke, U-250 Ferrite Bead	1586-0004	Ferroxcube	56-590-65/4B
L22	Choke, 56μH, 5% RF	1585-0042	Delevan	1537-64
L23	Choke, .33μH, 5%	1585-0052	Delevan	1535-04
L24	Choke, .22μH, 20%	1585-0039	Delevan	1537-02
L25	Choke, .47μH, 20%	1585-0031	Delevan	1537-06
L26	Choke, 2 1/2 Turns Wide Band	1586-0003	VK	20020/4B
L27	Choke, 2 1/2 Turns Wide Band	1586-0003	VK	20020/4B
L28	Choke, 2 1/2 Turns Wide Band	1586-0003	VK	20020/4B
L29	CH, 330μH, 10% RF Molded Mintr	1585-0078	Delevan	1025-80
	TRANSISTORS			
Q1	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q2	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q3	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q4	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q5	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q6	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q7	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q8	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q9	Trans, 2N5179 (RCA)	1272-0067	RCA	2N5179
Q10	Trans, 2N3563	1272-0022	Fairchild	2N3563

HIGH FREQUENCY PHASE LOCK LOOP, 3400 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
Q11	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q12	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q13	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q14	Trans, 2N5179 (RCA)	1272-0067	RCA	2N5179
Q15	Trans, 2N5179 (RCA)	1272-0067	RCA	2N5179
Q16	Not Used			
Q17	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q18	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q19	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q20	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q21	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q22	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q23	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q24	Trans, 2N5179 (RCA)	1272-0067	RCA	2N5179
Q25	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q26	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q27	Trans, 2N5179 (RCA)	1272-0067	RCA	2N5179
Q28	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q29	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q30	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q31	Trans, 2N4391	1272-0042	Teledyne	2N4391
Q32	Trans, 2N4391	1272-0042	Teledyne	2N4391
Q33	Trans, 2N4391	1272-0042	Teledyne	2N4391
Q34	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q35	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q36	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q37	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q38	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q39	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q40	Trans, 2N5179 (RCA)	1272-0067	RCA	2N5179
Q41	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q42	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q43	Trans, 2N3642	1272-0018	Fairchild	2N3642
	RESISTORS			
R1	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R2	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R3	Res, 20K, 5%, 1/4W Comp	1066-2035	Allen-Bradley	CB2035
R4	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R5	Res, 2K, 5%, 1/4W Comp	1066-2025	Allen-Bradley	CB2025
R6	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R7	Res, 560 Ohm, 5%, 1/4W Comp	1066-5615	Allen-Bradley	CB5615
R8	Res, 560 Ohm, 5%, 1/4W Comp	1066-5615	Allen-Bradley	CB5615
R9	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R10	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R11	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R12	Res, 430 Ohm, 5%, 1/4W Comp	1066-4315	Allen-Bradley	CB4315
R13	Res, 68K, 5%, 1/4W Comp	1066-6835	Allen-Bradley	CB6835
R14	Res, 91K, 5%, 1/4W Comp	1066-9135	Allen-Bradley	CB9135
R15	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035

HIGH FREQUENCY PHASE LOCK LOOP, 3400 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R16	Res, 24K, 5%, 1/4W Comp	1066-2435	Allen-Bradley	CB2435
R17	Res, 2K, 5%, 1/4W Comp	1066-2025	Allen-Bradley	CB2025
R18	Res, 91K, 5%, 1/4W Comp	1066-9135	Allen-Bradley	CB9135
R19	Res, 2K, 5%, 1/4W Comp	1066-2025	Allen-Bradley	CB2025
R20	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R21	Res, 56 Ohm, 5%, 1/4W Comp	1066-5605	Allen-Bradley	CB5605
R22	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R23	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R24	Res, 390 Ohm, 5%, 1/4W Comp	1066-3915	Allen-Bradley	CB3915
R25	Res, 20K, 5%, 1/4W Comp	1066-2035	Allen-Bradley	CB2035
R26	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R27	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R28	Res, 470 Ohm, 5%, 1/4W Comp	1066-4715	Allen-Bradley	CB4715
R29	Res, 470 Ohm, 5%, 1/4W Comp	1066-4715	Allen-Bradley	CB4715
R30	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R31	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R32	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R33	Res, 120 Ohm, 5%, 1/4W Comp	1066-1215	Allen-Bradley	CB1215
R34	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R35	Res, 120 Ohm, 5%, 1/4W Comp	1066-1215	Allen-Bradley	CB1215
R36	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R37	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R38	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R39	Res, 20K, 5%, 1/4W Comp	1066-2035	Allen-Bradley	CB2035
R40	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R41	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R42	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R43	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R44	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R45	Res, 2.7K, 5%, 1/4W Comp	1066-2725	Allen-Bradley	CB2725
R46	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R47	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R48	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R49	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R50	Res, 27 Ohm, 5%, 1/4W Comp	1066-2705	Allen-Bradley	CB2705
R51	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R52	Res, 27 Ohm, 5%, 1/4W Comp	1066-2705	Allen-Bradley	CB2705
R53	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R54	Res, 390 Ohm, 5%, 1/4W Comp	1066-3915	Allen-Bradley	CB3915
R55	Res, 4.7K, 5%, 1/4W Comp	1066-4725	Allen-Bradley	CB4725
R56	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R57	Res, 390 Ohm, 5%, 1/4W Comp	1066-3915	Allen-Bradley	CB3915
R58	Res, 4.7K, 5%, 1/4W Comp	1066-4725	Allen-Bradley	CB4725
R59	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R60	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R61	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R62	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R63	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R64	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R65	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015

HIGH FREQUENCY PHASE LOCK LOOP, 3400 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R66	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R67	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R68	Res, 270 Ohm, 5%, 1/4W Comp	1066-2715	Allen-Bradley	CB2715
R69	Res, 39 Ohm, 5%, 1/4W Comp	1066-3905	Allen-Bradley	CB3905
R70	Res, 680 Ohm, 5%, 1/4W Comp	1066-6815	Allen-Bradley	CB6815
R71	Not Used			
R72	Not Used			
R73	Not Used			
R74	Not Used			
R75	Not Used			
R76	Res, 22K, 5%, 1/4W Comp	1066-2235	Allen-Bradley	CB2235
R77	Res, 22K, 5%, 1/4W Comp	1066-2235	Allen-Bradley	CB2235
R78	Res, 4.7K, 5%, 1/4W Comp	1066-4725	Allen-Bradley	CB4725
R79	Res, 7.5K, 5%, 1/4W Comp	1066-7525	Allen-Bradley	CB7525
R80	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R81	Res, 4.7K, 5%, 1/4W Comp	1066-4725	Allen-Bradley	CB4725
R82	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R83	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R84	Res, 7.5K, 5%, 1/4W Comp	1066-7525	Allen-Bradley	CB7525
R85	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R86	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R87	Res, 240K, 5%, 1/4W Comp	1066-2445	Allen-Bradley	CB2445
R88	Res, 130K, 5%, 1/4W Comp	1066-1345	Allen-Bradley	CB1345
R89	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R90	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R91	Res, 910 Ohm, 5%, 1/4W Comp	1066-9115	Allen-Bradley	CB9115
R92	Res, 2.4K, 5%, 1/4W Comp	1066-2425	Allen-Bradley	CB2425
R93	Res, 16K, 5%, 1/4W Comp	1066-1635	Allen-Bradley	CB1635
R94	Res, 12K, 5%, 1/4W Comp	1066-1235	Allen-Bradley	CB1235
R95	Res, 100K, 5%, 1/4W Carbon Comp	1066-1045	Allen-Bradley	CB1045
R96	Res, 100K, 5%, 1/4W Carbon Comp	1066-1045	Allen-Bradley	CB1045
R97	Res, 100K, 5%, 1/4W Carbon Comp	1066-1045	Allen-Bradley	CB1045
R98	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R99	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R100	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R101	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R102	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R103	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R104	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R105	Res, 22K, 5%, 1/4W Comp	1066-2235	Allen-Bradley	CB2235
R106	Res, 22K, 5%, 1/4W Comp	1066-2235	Allen-Bradley	CB2235
R107	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R108	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R109	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R110	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R111	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R112	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R113	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R114	Res, 390 Ohm, 5%, 1/4W Comp	1066-3915	Allen-Bradley	CB3915
R115	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535

HIGH FREQUENCY PHASE LOCK LOOP, 3400 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R116	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R117	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R118	Res, 4.7K, 5%, 1/4W Comp	1066-4725	Allen-Bradley	CB4725
R119	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R120	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R121	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R122	Res, 4.7K, 5%, 1/4W Comp	1066-4725	Allen-Bradley	CB4725
R123	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R124	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R125	Res, 27 Ohm, 5%, 1/4W Comp	1066-2705	Allen-Bradley	CB2705
R126	Res, 390 Ohm, 5%, 1/4W Comp	1066-3915	Allen-Bradley	CB3915
R127	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R128	Res, 27 Ohm, 5%, 1/4W Comp	1066-2705	Allen-Bradley	CB2705
R129	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R130	Res, 2.2K, 5%, 1/4W Comp	1066-2225	Allen-Bradley	CB2225
R131	Res, 39 Ohm, 5%, 1/4W Comp	1066-3905	Allen-Bradley	CB3905
R132	Res, 27K, 5%, 1/4W Comp	1066-2735	Allen-Bradley	CB2735
R133	Res, 27K, 5%, 1/4W Comp	1066-2735	Allen-Bradley	CB2735
R134	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R135	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R136	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R137	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R138	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R139	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R140	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R141	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R142	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R143	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R144	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R145	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R146	Res, 20K, 5%, 1/4W Comp	1066-2035	Allen-Bradley	CB2035
R147	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R148	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R149	Res, 120 Ohm, 5%, 1/4W Comp	1066-1215	Allen-Bradley	CB1215
R150	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R151	Res, 39 Ohm, 5%, 1/4W Comp	1066-3905	Allen-Bradley	CB3905
R152	Res, 1.8K, 5%, 1/4W Comp	1066-1825	Allen-Bradley	CB1825
R153	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R154	Res, 180 Ohm, 5%, 1/4W Comp	1066-1815	Allen-Bradley	CB1815
R155	Res, 680 Ohm, 5%, 1/4W Comp	1066-6815	Allen-Bradley	CB6815
R156	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R157	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R158	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R159	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R160	Res, 4.3K, 5%, 1/4W Comp	1066-4325	Allen-Bradley	CB4325
R161	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R162	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025

HIGH FREQUENCY PHASE LOCK LOOP, 3400 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
	TRANSFORMERS			
T1	Assy, Trifilar Coil	1579-0017	Cushman	
T2	Assy, Trifilar Coil	1579-0017	Cushman	
T3	Assy, Trifilar Coil	1579-0017	Cushman	
T4	Assy, Trifilar Coil	1579-0017	Cushman	
T5	Assy, Trifilar Coil	1579-0017	Cushman	
T6	Assy, Trifilar Coil	1579-0017	Cushman	
	INTEGRATED CIRCUITS			
U1	IC, LM301A Op Amp	2025-0032	National	LM301A
U2	IC, MC4044P Phase Detector	2025-0066	Motorola	MC4044P
U3	IC, MC7805CP, 5V Pos Rgltr	2025-0088	Motorola	MC7805CP
U4	IC, MC4044P Phase Detector	2025-0066	Motorola	MC4044P
U5	IC, LM301A Op Amp	2025-0032	National	LM301A

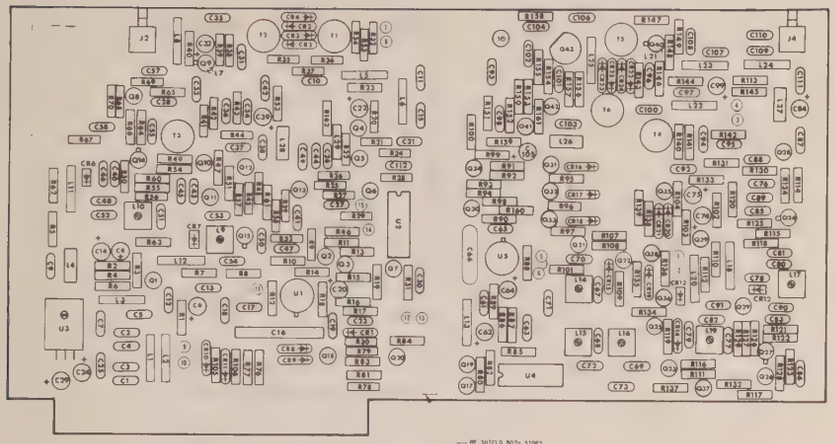


Figure 3-15. High Frequency Phase Lock Loop, 3400, sheet 1

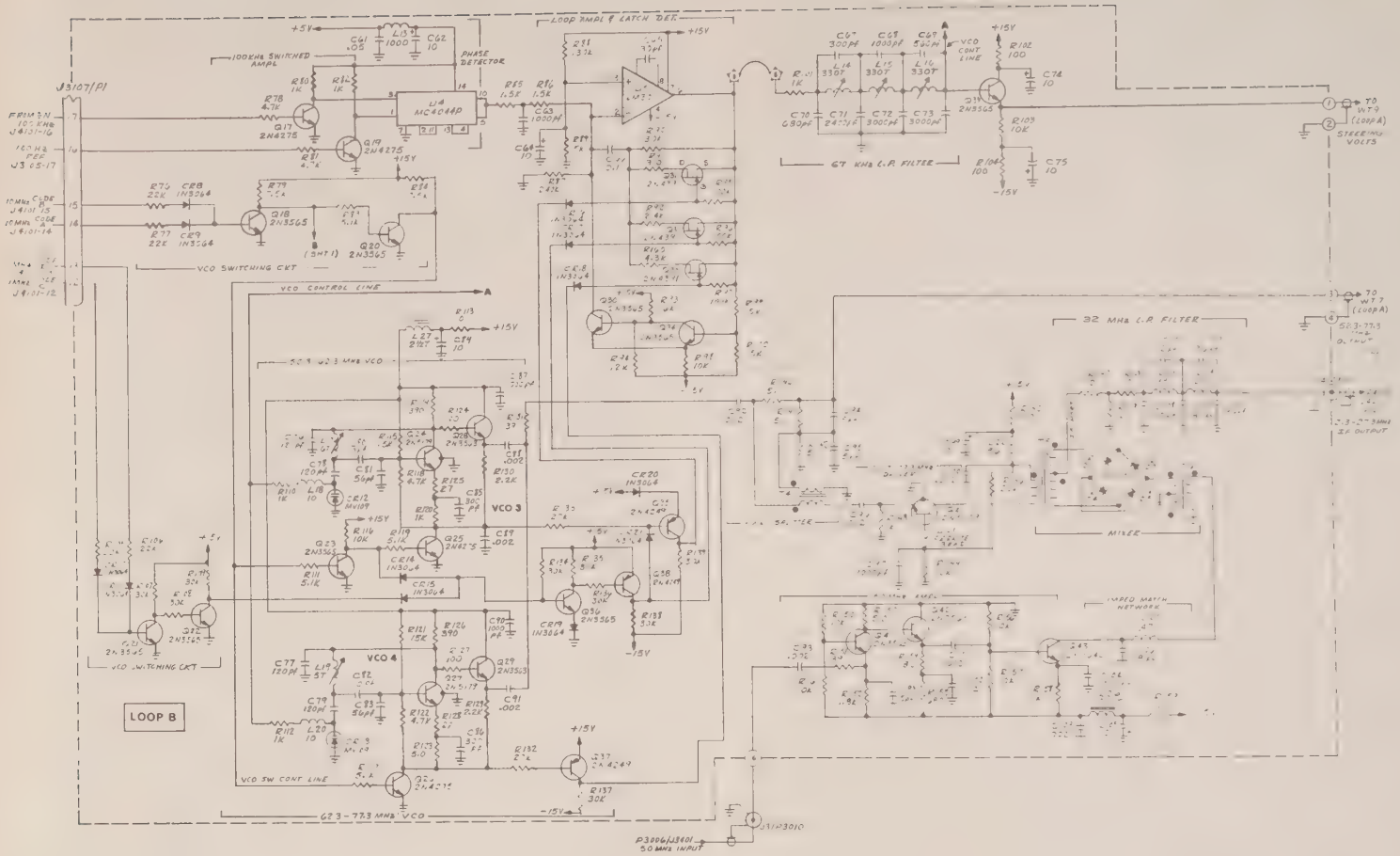


Figure 3-16. High Frequency Phase Lock Loop, 3400, sheet 2

ALC ATTENUATOR/MIXER, 3500

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
3500	PCB Assy, ALC Atten/Mixer	7001-0409	Cushman	
	PC Board	1780-0598	Cushman	
	CAPACITORS			
C1	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C2	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C3	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C4	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C5	Cap, 100μF, 10%, 25V	1013-0003	Sprague	30D107G025DD5
C6	Cap, 100μF, 10%, 25V	1013-0003	Sprague	30D107G025DD5
C7	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C8	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C9	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C10	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C11	Cap, 18PF, 5%, 500V Mica	1002-0014	Elmenco	DM15-C-180J
C12	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C13	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C14	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C15	Cap, 0039μF, 2%, 100V	1008-0050	TRW	863UW
C16	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C17	Not Used			
C18	Cap, 150PF, 5%, 500V Mica	1002-0021	Elmenco	DM15-F-151J
C19	Cap, 330PF, 5%, 500V Mica	1002-0032	Elmenco	DM15-F-331J
C20	Cap, 150PF, 5%, 500V Mica	1002-0021	Elmenco	DM15-F-151J
C21	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C22	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C23	Cap, 1MF, 50V DC 10% Electrolytic	1013-0004	Sprague	30D105G025BA5
C24	Cap, 470PF, 5%, 500V Mica	1002-0035	Elmenco	DM15-F-471J
C25	Cap, 1MF, 50V DC 10% Electrolytic	1013-0004	Sprague	30D105G025BA5
C26	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C27	Cap, 68PF, 5%, 500V Mica	1002-0013	Elmenco	DM15-E-680J
C28	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C29	Cap, 68PF, 5%, 500V Mica	1002-0013	Elmenco	DM15-E-680J
C30	Cap, 220PF, 5%, 500V Mica	1002-0029	Elmenco	DM15-F-221J
C31	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C32	Cap, 300PF, 5%, 500V Mica	1002-0059	Elmenco	DM15-F-301J
C33	Cap, 820PF, 5%, 300V Mica	1002-0039	Elmenco	DM15-F-821J
C34	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C35	Cap, 820PF, 5%, 300V Mica	1002-0039	Elmenco	DM15-F-821J
C36	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C37	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C38	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C39	Cap, 510PF, 5%, 500V Mica	1002-0036	Elmenco	DM15-F-511J
C40	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C41	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C42	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C43	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C44	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C45	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z

ALC ATTENUATOR/MIXER, 3500 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
C46	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C47	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C48	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C49	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C50	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C51	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C52	Cap, 10PF, 5%, 500V Mica	1002-0016	Elmenco	DM15-C-100J
C53	Cap, 10PF, 5%, 500V Mica	1002-0016	Elmenco	DM15-C-100J
C54	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C55	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C56	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C57	Not Used			
C58	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C59	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C60	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C61	Cap, 10PF, 5%, 500V Mica	1002-0016	Elmenco	DM15-C-100J
C62	Cap, 10PF, 5%, 500V Mica	1002-0016	Elmenco	DM15-C-100J
C63	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C64	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C65	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C66	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C67	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C68	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C69	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C70	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C71	Cap, 10PF, 5%, 500V Mica	1002-0016	Elmenco	DM15-C-100J
C72	Cap, 110PF, 5%, 500V Mica	1002-0026	Elmenco	DM15-F-111J
C73	Cap, 30PF, 5%, 500V Mica	1002-0043	Elmenco	DM15-E-300J
C74	Cap, 180PF, 5%, 500V Mica	1002-0005	Elmenco	DM15-F-181J
C75	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C76	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C77	Cap, 87PF, 1%, 500V Mica	1002-0047	Elmenco	DM15-E-870F
C78	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C79	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C80	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C81	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C82	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C83	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C84	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C85	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C86	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C87	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C88	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C89	Cap, 68PF, 5%, 500V Mica	1002-0013	Elmenco	DM15-E-680J
C90	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C91	Cap, 27PF, 5%, 500V Mica	1002-0008	Elmenco	DM15-E-270J
C92	Cap, 18PF, 5%, 500V Mica	1002-0014	Elmenco	DM15-C-180J
C93	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C94	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C95	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20

ALC ATTENUATOR/MIXER, 3500 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
C96	Cap, 6.8PF, .25PF%, 500V Tub.	1005-0006	Erie	301-000-C0H0-689C
C97	Cap, 150PF, 5%, 500V Mica	1002-0021	Elmenco	DM15-F-151J
C98	Cap, .002μF, 20%, 500V Disc	1005-0003	Erie	831-596-Z5U-202M
C99	Cap, 30PF, 5%, 500V Mica	1002-0043	Elmenco	DM15-E-300J
C100	Cap, 220PF, 5%, 500V Mica	1002-0029	Elmenco	DM15-F-221J
C101	Cap, 20PF, 5%, 500V Mica	1002-0060	Elmenco	DM15-E-200J
C102	Cap, 200PF, 5%, 500V Mica	1002-0042	Elmenco	DM15-F-201J
C103	Cap, 120PF, 5%, 500V Mica	1002-0010	Elmenco	DM15-F-121J
C104	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C105	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C106	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C107	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C108	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C109	Cap, 10PF, 5%, 500V Mica	1002-0016	Elmenco	DM15-C-100J
	DIODES			
CR1	Diode, MV109, Varicap 29PF 30V.4W Si	1281-0064	Motorola	MV109
CR2	Diode, G633	1282-0005	ITT	G633
CR3	Diode, G633	1282-0005	ITT	G633
CR4	Diode, G633	1282-0005	ITT	G633
CR5	Diode, G633	1282-0005	ITT	G633
CR6	Diode, MPN3401	1281-0050	Motorola	MPN3401
CR7	Diode, MPN3401	1281-0050	Motorola	MPN3401
CR8	Diode, MPN3401	1281-0050	Motorola	MPN3401
CR9	Diode, MPN3401	1281-0050	Motorola	MPN3401
CR10	Diode, MPN3401	1281-0050	Motorola	MPN3401
CR11	Diode, MPN3401	1281-0050	Motorola	MPN3401
CR12	Diode, MPN3401	1281-0050	Motorola	MPN3401
CR13	Diode, MPN3401	1281-0050	Motorola	MPN3401
CR14	Diode, Microwave Pin 1SV34	1281-0075	Nippon Elec	1SV34
CR15	Diode, 1N3064	1281-0013	Teledyne	1N3064
	CONNECTORS			
J1	Not Used			
J2	Conn, SMB 50 Ohm Rtang Jk Pc Mt Snap-on	2536-0060	Cablewave	700214NP
J3	Not Used			
J4	Conn, SMB 50 Ohm Rtang Jk Pc Mt Snap-on	2536-0060	Cablewave	700214NP
	INDUCTORS			
L1	Choke, 1000μH, 5%	1585-0020	Delevan	2500-28
L2	Choke, 1000μH, 5%	1585-0020	Delevan	2500-28
L3	Choke, .47μH, 20%	1585-0031	Delevan	1537-05
L4	Choke, 1μH, 10%	1585-0027	Delevan	1537-12
L5	Choke, 10μH, 10%	1585-0016	Delevan	1537-36
L6	Coil, Variable IF 2 Turns	1596-6601	Cushman	
L7	Choke, 1μH, 10%	1585-0027	Delevan	1537-12
L8	Choke, 2.2μH, 10%	1585-0013	Delevan	1537-20
L9	Choke, 220μH, 5%	1585-0018	Delevan	1537-92
L10	Choke, 220μH, 5%	1585-0018	Delevan	1537-92

ALC ATTENUATOR/MIXER, 3500 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
L11	Choke, 220μH, 5%	1585-0018	Delevan	1537-92
L12	Choke, 220μH, 5%	1585-0018	Delevan	1537-92
L13	Choke, 10μH, 10%	1585-0016	Delevan	1537-36
L14	Choke, 1μH, 10%	1585-0027	Delevan	1537-12
L15	Choke, .39μH, 10% RF Molded	1585-0062	Delevan	1537-884
L16	Choke, .33μH, 5%	1585-0052	Delevan	1535-04
L17	Choke, 10μH, 10%	1585-0016	Delevan	1537-36
L18	Choke, 10μH, 10%	1585-0016	Delevan	1537-36
L19	Coil Assy, Variable IF 3 1/2 Turn	1596-0238	Cushman	
L20	Coil Assy, Variable IF 7 Turn	1596-0239	Cushman	
L21	Coil Assy, Variable IF 7 Turn	1596-0239	Cushman	
L22	Coil Assy, Variable IF 7 Turn	1596-0239	Cushman	
L23	Choke, 100μH, 5%	1585-0017	Delevan	1537-76
	TRANSISTORS			
Q1	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q2	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q3	Trans, 2N3642	1272-0018	Fairchild	2N3642
Q4	Not Used			
Q5	Not Used			
Q6	Trans, 2N5962	1272-0059	Fairchild	2N5962
Q7	Trans, 2N5962	1272-0059	Fairchild	2N5962
Q8	Trans, 2N5179 (RCA)	1272-0067	RCA	2N5179
Q9	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q10	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q11	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q12	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q13	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q14	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q15	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q16	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q17	Trans, 2N5179 (RCA)	1272-0067	RCA	2N5179
Q18	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q19	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q20	Trans, 2N5179 (RCA)	1272-0067	RCA	2N5179
Q21	Trans, 2N4275	1272-0016	Fairchild	2N4275
Q22	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q23	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q24	Trans, 2N4275	1272-0016	Fairchild	2N4249
Q25	Trans, 2N3563	1272-0022	Fairchild	2N3563
Q26	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q27	Trans, 2N3565	1272-0017	Fairchild	2N3565
	RESISTORS			
R1	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R2	Res, 8.2K, 5%, 1/4W Comp	1066-8225	Allen-Bradley	CB8225
R3	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R4	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R5	Res, 680 Ohm, 5%, 1/4W Comp	1066-6815	Allen-Bradley	CB6815

ALC ATTENUATOR/MIXER, 3500 (cont)

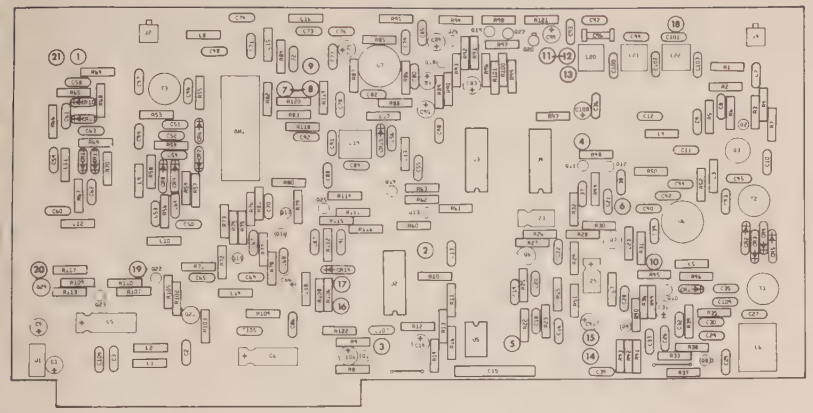
CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R6	Res, 180 Ohm, 5%, 1/4W Comp	1066-1815	Allen-Bradley	CB1815
R7	Res, 470 Ohm, 5%, 1/4W Comp	1066-4715	Allen-Bradley	CB4715
R8	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R9	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R10	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R11	Res, 1.5K, 5%, 1/4W Comp	1066-1525	Allen-Bradley	CB1525
R12	Res, 240K, 5%, 1/4W Comp	1066-2445	Allen-Bradley	CB2445
R13	Res, 130K, 5%, 1/4W Comp	1066-1345	Allen-Bradley	CB1345
R14	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R15	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R16	Res, 24K, 5%, 1/4W Comp	1066-2435	Allen-Bradley	CB2435
R17	Not Used			
R18	Not Used			
R19	Not Used			
R20	Not Used			
R21	Not Used			
R22	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R23	Res, 4.7K, 5%, 1/4W Comp	1066-4725	Allen-Bradley	CB4725
R24	Not Used			
R25	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R26	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R27	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R28	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R29	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R30	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R31	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R32	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R33	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R34	Res, 4.7K, 5%, 1/4W Comp	1066-4725	Allen-Bradley	CB4725
R35	Not Used			
R36	Res, 220 Ohm, 5%, 1/4W Comp	1066-2215	Allen-Bradley	CB2215
R37	Res, 220 Ohm, 5%, 1/4W Comp	1066-2215	Allen-Bradley	CB2215
R38	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R39	Res, 220 Ohm, 5%, 1/4W Comp	1066-2215	Allen-Bradley	CB2215
R40	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R41	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R42	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R43	Res, 47 Ohm, 5%, 1/4W Comp	1066-4705	Allen-Bradley	CB4705
R44	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R45	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R46	Res, 150 Ohm, 5%, 1/4W Comp	1066-1515	Allen-Bradley	CB1515
R47	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R48	Res, 2K, 5%, 1/4W Comp	1066-2025	Allen-Bradley	CB2025
R49	Res, 4.7K, 5%, 1/4W Comp	1066-4725	Allen-Bradley	CB4725
R50	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R51	Res, 220 Ohm, 5%, 1/4W Comp	1066-2215	Allen-Bradley	CB2215
R52	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R53	Res, 180 Ohm, 5%, 1/4W Comp	1066-1815	Allen-Bradley	CB1815
R54	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R55	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025

ALC ATTENUATOR/MIXER, 3500 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R56	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R57	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R58	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R59	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R60	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R61	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R62	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R63	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R64	Res, 180 Ohm, 5%, 1/4W Comp	1066-1815	Allen-Bradley	CB1815
R65	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R66	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R67	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R68	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R69	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R70	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R71	Res, 180 Ohm, 5%, 1/4W Comp	1066-1815	Allen-Bradley	CB1815
R72	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R73	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R74	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R75	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R76	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R77	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R78	Res, 430 Ohm, 5%, 1/4W Comp	1066-4315	Allen-Bradley	CB4315
R79	Res, 680 Ohm, 5%, 1/4W Comp	1066-6815	Allen-Bradley	CB6815
R80	Res, 43 Ohm, 5%, 1/4W Comp	1066-4305	Allen-Bradley	CB4305
R81	Res, 360 Ohm, 5%, 1/4W Comp	1066-3615	Allen-Bradley	CB3615
R82	Res, 18 Ohm, 5%, 1/4W Comp	1066-1805	Allen-Bradley	CB1805
R83	Res, 300 Ohm, 5%, 1/4W Comp	1066-3015	Allen-Bradley	CB3015
R84	Res, 300 Ohm, 5%, 1/4W Comp	1066-3015	Allen-Bradley	CB3015
R85	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R86	Res, 470 Ohm, 5%, 1/4W Comp	1066-4715	Allen-Bradley	CB4715
R87	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R88	Res, 470 Ohm, 5%, 1/4W Comp	1066-4715	Allen-Bradley	CB4715
R89	Res, 7.5K, 5%, 1/4W Comp	1066-7525	Allen-Bradley	CB7525
R90	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R91	Res, 7.5K, 5%, 1/4W Comp	1066-7525	Allen-Bradley	CB7525
R92	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R93	Res, 470 Ohm, 5%, 1/4W Comp	1066-4715	Allen-Bradley	CB4715
R94	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R95	Res, 220 Ohm, 5%, 1/4W Comp	1066-2215	Allen-Bradley	CB2215
R96	Res, 1.6K, 5%, 1/4W Comp	1066-1625	Allen-Bradley	CB1625
R97	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R98	Res, 620 Ohm, 5%, 1/4W Comp	1066-6215	Allen-Bradley	CB6215
R99	Res, 4.3K, 5%, 1/4W Comp	1066-4325	Allen-Bradley	CB4325
R100	Res, 7.5K, 5%, 1/4W Comp	1066-7525	Allen-Bradley	CB7525
R101	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R102	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R103	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R104	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R105	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025

ALC ATTENUATOR/MIXER, 3500 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R106	Res, 510 Ohm, 5%, 1/4W Comp	1066-5115	Allen-Bradley	CB5115
R107	Res, 6.8K, 5%, 1/4W Comp	1066-6825	Allen-Bradley	CB6825
R108	Res, 2K, 5%, 1/4W Comp	1066-2025	Allen-Bradley	CB2025
R109	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R110	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R111	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R112	Res, 5.1K, 5%, 1/4W Comp	1066-5125	Allen-Bradley	CB5125
R113	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R114	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB1025
R115	Res, 24 Ohm, 5%, 1/4W Comp	1066-2405	Allen-Bradley	CB2405
R116	Res, 1.8K, 5%, 1/4W Comp	1066-1825	Allen-Bradley	CB1825
R117	Res, 6.8K, 5%, 1/4W Comp	1066-6825	Allen-Bradley	CB6825
R118	Res, 160 Ohm, 5%, 1/4W Comp	1066-1615	Allen-Bradley	CB1615
R119	Res, 91 Ohm, 5%, 1/4W Comp	1066-9105	Allen-Bradley	CB9105
R120	Res, 160 Ohm, 5%, 1/4W Comp	1066-1615	Allen-Bradley	CB1615
R121	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R122	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
	TRANSFORMERS			
T1	Assy, Trifilar Coil	1579-0017	Cushman	
T2	Assy, Trifilar Coil	1579-0017	Cushman	
T3	Assy, Trifilar Coil	1579-0017	Cushman	
	INTEGRATED CIRCUITS			
U1	IC, MC7805CP, 5V Pos Rgltr	2025-0088	Motorola	MC7805CP
U2	IC, MC4044P Phase Detector	2025-0066	Motorola	MC4044P
U3	IC, SN74L90N Decade Counter	2025-0071	T.I.	SN74L90N
U4	IC, SN74L00N	2025-0036	T.I.	SN74L00N
U5	IC, SN72741P	2025-0067	T.I.	SN72741P
U6	IC, CA3012	2025-0013	RCA	CA3012
U7	IC, UA733C Video Amp	2025-0025	Signetics	N5733A
	MIXER			
Z1	Mixer, Double Balanced	2010-0005	Cushman	



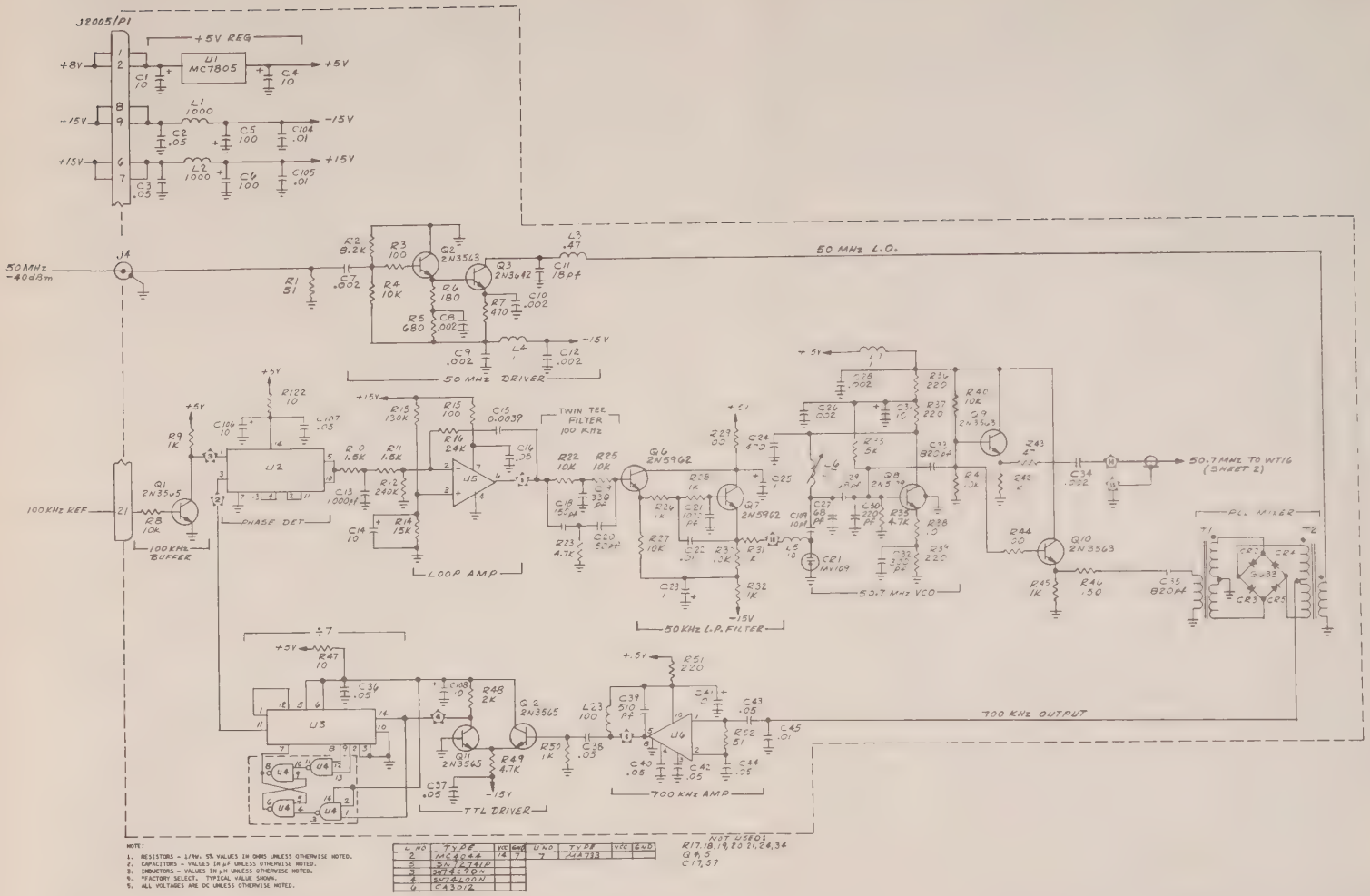


Figure 3-17. ALC Attenuator/Mixer, 3500, sheet 1

5601**0066

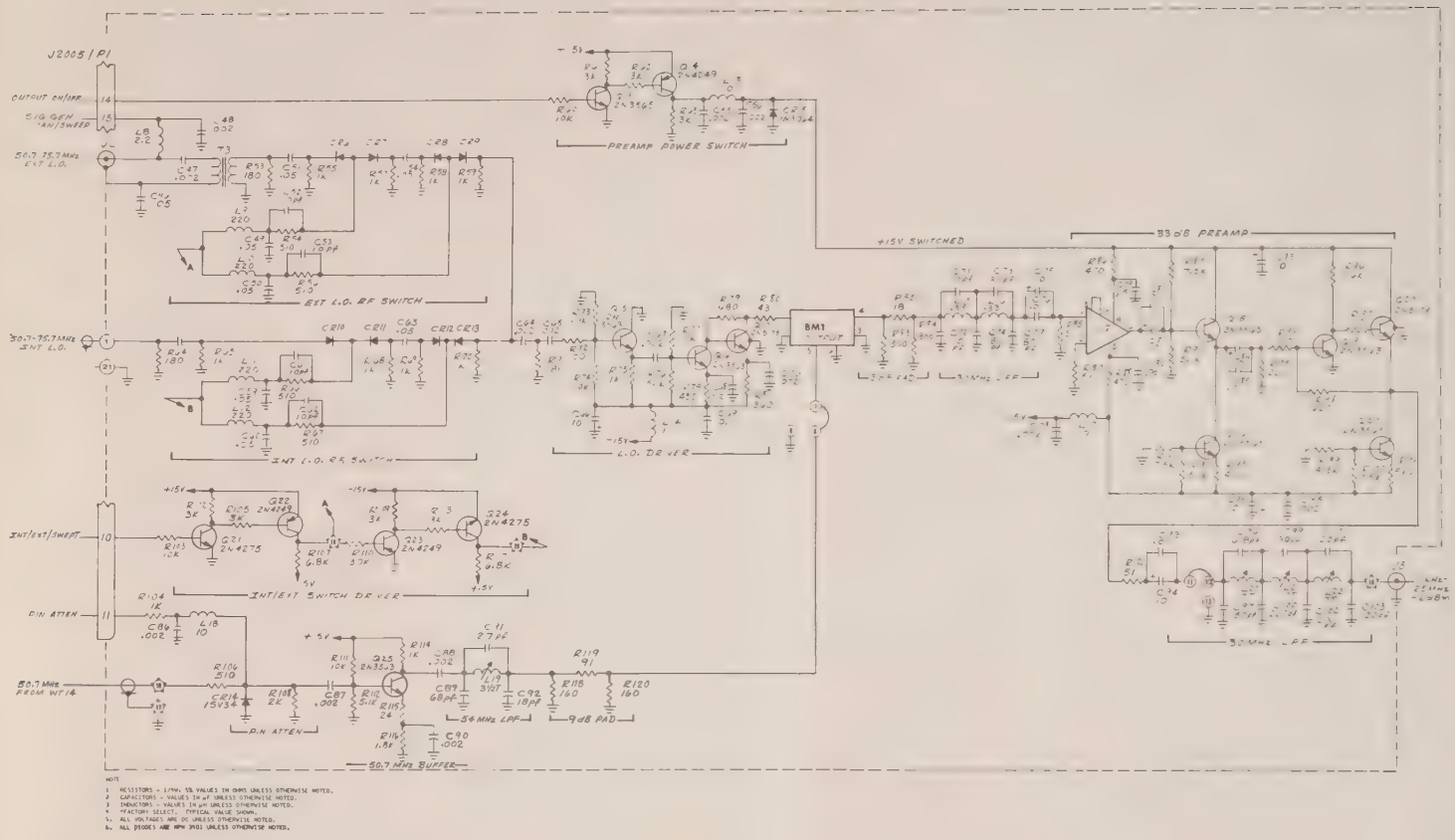


Figure 3-18. ALC Attenuator/Mixer, 3500, sheet 2

5601**0066

POWER AMPLIFIER/DETECTOR, 3700

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
3700	PCB Assy, Power Ampl/Detector	7001-0412	Cushman	
	PC Board	1780-0583	Cushman	
	CAPACITORS			
C1	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C2	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C3	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C4	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C5	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C6	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C7	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C8	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C9	Cap, 500μF, +100-10%, 25V	1014-0002	Ill. Elna	25T500
C10	Cap, 100μF, 10%, 25V	1013-0003	Sprague	30D107G025DD5
C11	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C12	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C13	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C14	Cap, 5000PF, 5%, 500V Mica	1002-0075	Elmenco	DM19-F-502J
C15	Cap, 220PF, 5%, 500V Mica	1002-0029	Elmenco	DM15-F-221J
C16	Cap, 5000PF, 5%, 500V Mica	1002-0075	Elmenco	DM19-F-502J
C17	Cap, 1000PF, 10%, 100V Min Cer	1005-0081	Erie	8121-100-W5R-102K
C18	Cap, .1μF, 10%, 100V	1008-0031	Sprague	225P10491
C19	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C20	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C21	Cap, 1000PF, 10%, 100V Min Cer	1005-0081	Erie	8121-100-W5R-102K
C22	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C23	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C24	Cap, 1.9PF to 15.7PF	1000-0010	E.F. Johnson	187-109-105
C25	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C26	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C27	Cap, 1000PF, 10%, 100V Min Cer	1005-0081	Erie	8121-100-W5R-102K
C28	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C29	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C30	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C31	Cap, 1000PF, 10%, 100V Min Cer	1005-0081	Erie	8121-100-W5R-102K
C32	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C33	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C34	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C35	Cap, 5000PF, 5%, 500V Mica	1002-0075	Elmenco	DM19-F-502J
C36	Cap, 5000PF, 5%, 500V Mica	1002-0075	Elmenco	DM19-F-502J
C37	Cap, 1000PF, 10%, 100V Min Cer	1005-0081	Erie	8121-100-W5R-102K
C38	Cap, 1000PF, 10%, 100V Min Cer	1005-0081	Erie	8121-100-W5R-102K
C39	Cap, .01μF, 20%, 50V Mini	1005-0102	Erie	8121-050-651-103M
C40	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C41	Cap, 10μF, +50-20%, 35V	1011-0006	ITT	TAG 10/35-20
C42	Cap, FSV, 5%, 500V Mica	1002-xxxx	Elmenco	DM15-E-xxxJ
C43	Cap, 9-35PF, 200V, Horiz Trim	1001-0005	Erie	538-006-D9-35
C44	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C45	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z

POWER AMPLIFIER/DETECTOR, 3700 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
C46	Not Used			
C47	Cap, .047μF, 20%, 100V Mini	1005-0096	Erie	8121-100-651-473M
C48	Cap, .47μF, 10%, 50V	1005-0092	Cap. Sales	CK06BX474K
C49	Cap, 1000PF, 5%, 100V Mica	1002-0015	Elmenco	DM15-F-102J
C50	Cap, 100μF, 20%, 20V	1011-0010	Kemet	T363D107M020AS
C51	Cap, 4700PF, 5%, 500V Mica	1002-0070	Elmenco	DM19-F-472J
C52	Cap, .47μF, 10%, 50V	1005-0092	Cap. Sales	CK06BX474K
C53	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C54	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C55	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C56	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C57	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C58	Cap, 100μF, 10%, 25V	1013-0003	Sprague	30D107G025DD5
C59	Cap, .01μF, +80-20%, 25V Disc	1005-0013	Erie	5835-512-Y5U-103Z
C60	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
C61	Cap, .05μF, +80-20%, 25V Disc	1005-0014	Erie	5855-505-Y5U0-503Z
	DIODES			
CR1	Diode, 1N4733	1281-0015	Motorola	1N4733
CR2	Dio, 1N914B, Si Switching 100 PIV	1281-0112	Fairchild	1N914B
CR3	Dio, 1N914B, Si Switching 100 PIV	1281-0112	Fairchild	1N914B
CR4	Dio, 1N914B, Si Switching 100 PIV	1281-0112	Fairchild	1N914B
CR5	Dio, 1N914B, Si Switching 100 PIV	1281-0112	Fairchild	1N914B
CR6	Dio, 1N914B, Si Switching 100 PIV	1281-0112	Fairchild	1N914B
CR7	Dio, 1N914B, Si Switching 100 PIV	1281-0112	Fairchild	1N914B
CR8	Dio, 1N914B, Si Switching 100 PIV	1281-0112	Fairchild	1N914B
CR9	Dio, 1N914B, Si Switching 100 PIV	1281-0112	Fairchild	1N914B
CR10	Dio, HP2804, Hot Carrier - Mtchd Pr.	1283-0007	HPA	5082-2804
CR11	Not Used			
CR12	Diode, 1N827	1281-0038	Transitron	1N827
CR13	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR14	Diode, 1N3064	1281-0013	Teledyne	1N3064
	CONNECTORS			
J1	Conn, SMB 50 Ohm Rtang Jk Pc Mt Snap-on	2536-0060	Cablewave	700214NP
J2	Conn, SMB 50 Ohm Rtang Jk Pc Mt Snap-on	2536-0060	Cablewave	700214NP
J3	Conn, SMB 50 Ohm Rtang Jk Pc Mt Snap-on	2536-0060	Cablewave	700214NP
J4	Conn, SMB 50 Ohm Rtang Jk Pc Mt Snap-on	2536-0060	Cablewave	700214NP
	INDUCTORS			
L1	Choke, 10μH, 10%	1585-0016	Delevan	1537-36
L2	Choke, 10μH, 10%	1585-0016	Delevan	1537-36
L3	Choke, 10μH, 10%	1585-0016	Delevan	1537-36
L4	Choke, 10μH, 10%	1585-0016	Delevan	1537-36
L5	Choke, 47μH, 5%	1585-0010	Delevan	1537-60

POWER AMPLIFIER/DETECTOR, 3700 (cont)

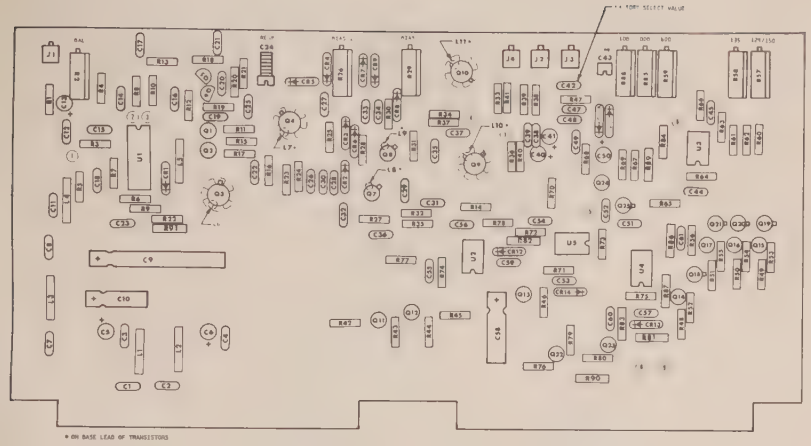
CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
L6	Choke, U-250 Ferrite Bead	1586-0004	Ferroxcube	56-590-65/4B
L7	Choke, U-250 Ferrite Bead	1586-0004	Ferroxcube	56-590-65/4B
L8	Choke, U-250 Ferrite Bead	1586-0004	Ferroxcube	56-590-65/4B
L9	Choke, U-250 Ferrite Bead	1586-0004	Ferroxcube	56-590-65/4B
L10	Choke, U-250 Ferrite Bead	1586-0004	Ferroxcube	56-590-65/4B
L11	Choke, U-250 Ferrite Bead	1586-0004	Ferroxcube	56-590-65/4B
	TRANSISTORS			
Q1	Xstr, 2N4258, PNP Si	1272-0097	Fairchild	2N4258
Q2	Xstr, 2N4258, PNP Si	1272-0097	Fairchild	2N4258
Q3	Xstr, 2N5160, PNP Si RF Pwr	1272-0099	Motorola	2N5160
Q4	Trans, 2N3866	1271-0005	RCA	2N3866
Q5	Xstr, MPS 3646, NPN Si	1272-0098	Motorola	MPS3646
Q6	Xstr, MPS 3646, NPN Si	1272-0098	Motorola	MPS3646
Q7	Trans, 2N3866	1271-0005	RCA	2N3866
Q8	Xstr, 2N5160, PNP Si, RF Pwr	1272-0099	Motorola	2N5160
Q9	Trans, 2N3866	1271-0005	RCA	2N3866
Q10	Xstr, 2N5160, PNP Si, RF Pwr	1272-0099	Motorola	2N5160
Q11	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q12	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q13	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q14	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q15	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q16	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q17	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q18	Trans, 2N4092	1272-0025	Teledyne	2N4092
Q19	Trans, 2N4092	1272-0025	Teledyne	2N4092
Q20	Trans, 2N4092	1272-0025	Teledyne	2N4092
Q21	Trans, 2N4092	1272-0025	Teledyne	2N4092
Q22	Trans, 2N3565	1272-0017	Fairchild	2N3565
Q23	Trans, 2N4249	1272-0024	Fairchild	2N4249
Q24	Xstr, E105, Sij-Fet N-Channel	1272-0103	Siliconix	E105
Q25	Trans, 2N4092	1272-0025	Teledyne	2N4092
	RESISTORS			
R1	Res, 51.1 Ohm, 1%, 1/8W MF	1075-0077	Dale	MF 1/8
R2	Pot, 100K, 10%, 3/4W	1215-0006	Helitrim	89WR
R3	Res, 680 Ohm, 5%, 1/4W Comp	1066-6815	Allen-Bradley	CB6815
R4	Res, 200K, 5%, 1/4W Comp	1066-2045	Allen-Bradley	CB2045
R5	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R6	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R7	Res, 330 Ohm, 5%, 1/4W Comp	1066-3315	Allen-Bradley	CB3315
R8	Res, 9.1K, 5%, 1/4W Comp	1066-9125	Allen-Bradley	CB9125
R9	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R10	Res, 3.6K, 5%, 1/4W Comp	1066-3625	Allen-Bradley	CB3625
R11	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R12	Res, 6.19K, 1%, 1/8W MF	1075-0109	Dale	MF 1/8
R13	Res, 511 Ohm, 1%, 1/10W MF	1074-1008	Dale	MF 1/10
R14	Res, 511 Ohm, 1%, 1/10W MF	1074-1008	Dale	MF 1/10
R15	Res, 511 Ohm, 1%, 1/10W MF	1074-1008	Dale	MF 1/10

POWER AMPLIFIER/DETECTOR, 3700 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R16	Res, 39 Ohm, 5%, 1/4W Comp	1066-3905	Allen-Bradley	CB3905
R17	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R18	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R19	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R20	Res, 51 Ohm, 5%, 1/4W Comp	1066-5105	Allen-Bradley	CB5105
R21	Res, 47 Ohm, 5%, 1/4W Comp	1066-4705	Allen-Bradley	CB4705
R22	Res, 825 Ohm, 1%, 1/10W	1074-1000	Dale	MF 1/10
R23	Res, 6.19K, 1%, 1/8W MF	1075-0109	Dale	MF 1/8
R24	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R25	Res, 825 Ohm, 1%, 1/10W	1074-1000	Dale	MF 1/10
R26	Pot, 100 Ohm, 10%, 3/4W	1215-0010	Helitrim	89WR
R27	Res, 18 Ohm, 5%, 1/4W Comp	1066-1805	Allen-Bradley	CB1805
R28	Res, 22 Ohm, 5%, 1/4W Comp	1066-2205	Allen-Bradley	CB2205
R29	Pot, 500 Ohm, 10%, 3/4W	1215-0011	Helitrim	89WR
R30	Res, 22 Ohm, 5%, 1/4W Comp	1066-2205	Allen-Bradley	CB2205
R31	Res, 18 Ohm, 5%, 1/4W Comp	1066-1805	Allen-Bradley	CB1805
R32	Res, 33 Ohm, 5%, 1/4W Comp	1066-3305	Allen-Bradley	CB3305
R33	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R34	Res, 33 Ohm, 5%, 1/4W Comp	1066-3305	Allen-Bradley	CB3305
R35	Res, 33 Ohm, 5%, 1/4W Comp	1066-3305	Allen-Bradley	CB3305
R36	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R37	Res, 33 Ohm, 5%, 1/4W Comp	1066-3305	Allen-Bradley	CB3305
R38	Res, 75 Ohm, 1%, 1/8W MF	1075-0035	Dale	MF 1/8
R39	Res, 75 Ohm, 1%, 1/8W MF	1075-0035	Dale	MF 1/8
R40	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R41	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
R42	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1005
R43	Res, 47K, 5%, 1/4W Comp	1066-4735	Allen-Bradley	CB1005
R44	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1005
R45	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1005
R46	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1005
R47	Res, 75 Ohm, 1%, 1/8W MF	1075-0035	Dale	MF 1/8
R48	Res, 47K, 5%, 1/4W Comp	1066-4735	Allen-Bradley	CB4735
R49	Res, 47K, 5%, 1/4W Comp	1066-4735	Allen-Bradley	CB4735
R50	Res, 47K, 5%, 1/4W Comp	1066-4735	Allen-Bradley	CB4735
R51	Res, 47K, 5%, 1/4W Comp	1066-4735	Allen-Bradley	CB4735
R52	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R53	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R54	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R55	Res, 30K, 5%, 1/4W Comp	1066-3035	Allen-Bradley	CB3035
R56	Res, 29.4K, 1%, 1/10W MF	1074-0092	Dale	MF 1/10
R57	Pot, 10K, 10%, 3/4W	1215-0014	Helitrim	89WR
R58	Pot, 10K, 10%, 3/4W	1215-0014	Helitrim	89WR
R59	Pot, 10K, 10%, 3/4W	1215-0014	Helitrim	89WR
R60	Res, 27.4K, 1%, 1/10W MF	1074-1004	Dale	MF 1/10
R61	Res, 27.4K, 1%, 1/10W MF	1074-1004	Dale	MF 1/10
R62	Res, 23.2K, 1%, 1/10W MF	1074-1006	Dale	MF 1/10
R63	Res, 15K, 5%, 1/4W Comp	1066-1535	Allen-Bradley	CB1535
R64	Res, 29.4K, 1%, 1/10W MF	1074-0092	Dale	MF 1/10
R65	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015

POWER AMPLIFIER/DETECTOR, 3700 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R66	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R67	Res, 6.81K, 1%, 1/8W 100 PPM	1075-0140	Dale	MF 1/8
R68	Res, 68K, 5%, 1/4W Comp	1066-6835	Allen-Bradley	MF 1/8
R69	Res, 6.81K, 1%, 1/8W 100 PPM	1075-0140	Dale	MF 1/8
R70	Res, 5.6K, 5%, 1/4W Comp	1066-5625	Allen-Bradley	CB5625
R71	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R72	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R73	Res, 62K, 5%, 1/4W Carbon Comp	1066-6235	Allen-Bradley	CB6235
R74	Res, 16.2K, 1%, 1/8W MF	1075-0057	Dale	MF 1/8
R75	Res, 4.99K, 1%, 1/8W MF	1075-0095	Dale	MF 1/8
R76	Res, 10K, 5%, 1/4W Comp	1066-1035	Allen-Bradley	CB1035
R77	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R78	Res, 220 Ohm, 5%, 1/4W Comp	1066-2215	Allen-Bradley	CB2215
R79	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R80	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R81	Res, 3K, 5%, 1/4W Comp	1066-3025	Allen-Bradley	CB3025
R82	Res, 1K, 5%, 1/4W Comp	1066-1025	Allen-Bradley	CB3025
R83	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB3025
R84	Res, 10K, 1%, 1/8W MF	1075-0009	Dale	MF 1/8
R85	Pot, 5K, 10%, 3/4W	1215-0012	Helitrim	89WR
R86	Res, 100 Ohm, 5%, 1/4W Comp	1066-1015	Allen-Bradley	CB1015
R87	Res, 2K, 1%, 1/8W MF	1075-0103	Dale	MF 1/8
R88	Pot, 10K, 10%, 3/4W	1215-0014	Helitrim	89WR
R89	Res, 36.5K, 1%, 1/8W MF	1075-0113	Dale	MF 1/8
R90	Res, 68.1K, 1%, 1/8W MF	1075-0136	Dale	MF 1/8
R91	Res, 10 Ohm, 5%, 1/4W Comp	1066-1005	Allen-Bradley	CB1005
	INTEGRATED CIRCUITS			
U1	IC, CA3046, Xstr and D10 Array	2025-0171	RCA	CA3046
U2	IC, SN72741P	2025-0067	T.I.	SN72741P
U3	IC, SN72741P	2025-0067	T.I.	SN72741P
U4	IC, SN72741P	2025-0067	T.I.	SN72741P
U5	IC, SN72741P	2025-0067	T.I.	SN72741P



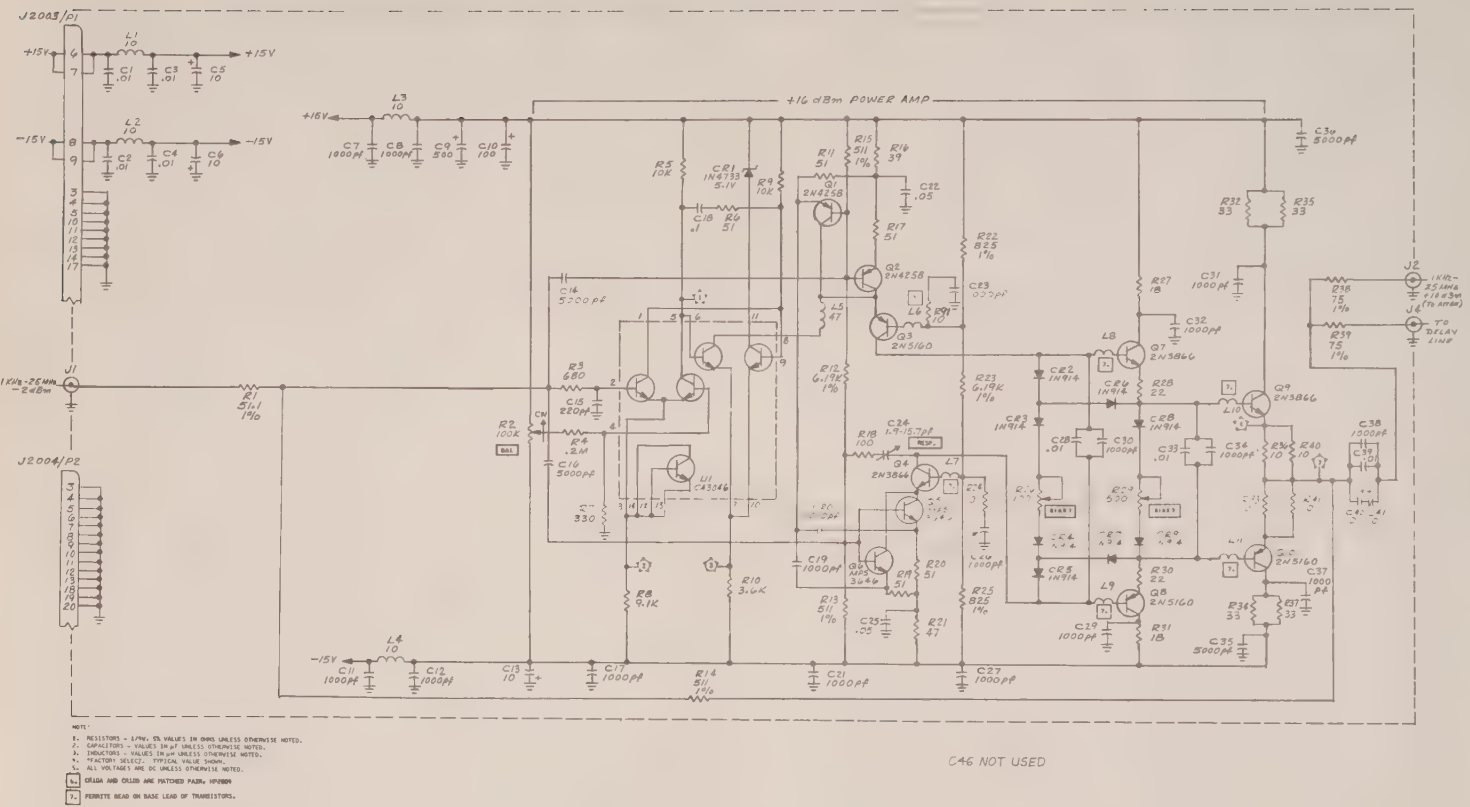

J2003/P1
J2004/P2
J1
+15V
-15V
+16 dBm POWER AMP
C46 NOT USED
NOTE:
1. RESISTORS - 1/4W, 5% VALUES IN OHMS UNLESS OTHERWISE NOTED.
2. CAPACITORS - VALUES IN μF UNLESS OTHERWISE NOTED.
3. INDUCTORS - VALUES IN μH UNLESS OTHERWISE NOTED.
4. *FACTORY SELECT. TYPICAL VALUE SHOWN.
5. ALL VOLTAGES ARE DC UNLESS OTHERWISE NOTED.
6. Q15A AND Q15B ARE MATCHED PAIR, MPM809
7. FERRITE BEAD ON BASE LEAD OF TRANSISTORS.

Figure 3-19. Power Amplifier/Detector, 370Q, sheet 1

5601-0066

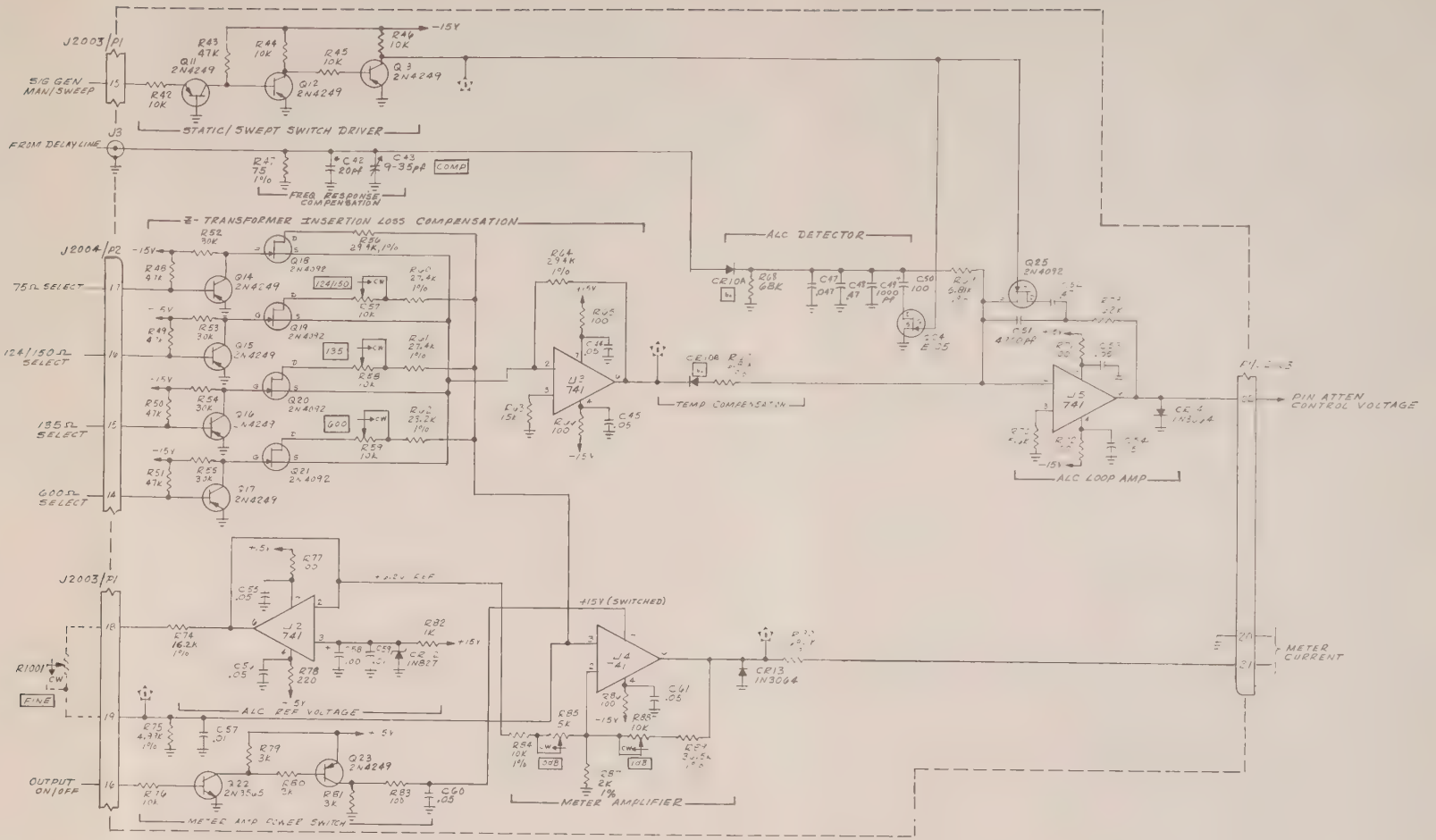


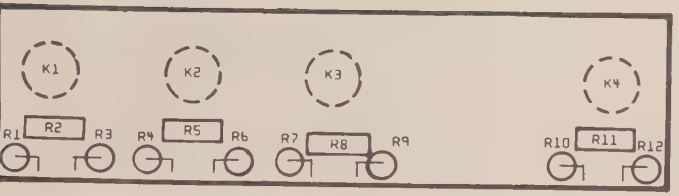
Figure 3-20. Power Amplifier/Detector, 3700, sheet 2

UNITS ATTENUATOR, 3800

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
3800	PCB Attenuator Assy, Units	7001-0413	Cushman	
	PC Board	1780-0561	Cushman	
	CAPACITORS			
C1	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C2	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
C3	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C4	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
C5	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C6	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
C7	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C8	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
C9	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C10	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
C11	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C12	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
C13	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C14	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
C15	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C16	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
	DIODES			
CR1	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR2	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR3	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR4	Diode, 1N3064	1281-0013	Teledyne	1N3064
	CONNECTORS			
J1	Conn, Mintr 75 Ohm Str Jk Bhd Mt	2536-0065	Cablewave	700611NP
J2	Conn, Mintr 75 Ohm Str Jk Bhd Mt	2536-0065	Cablewave	700611NP
	INDUCTORS			
L1	CH, 68μH, 10% RF Molded	1585-0069	Delevan	1025-64
L2	CH, 68μH, 10% RF Molded	1585-0069	Delevan	1025-64
L3	CH, 68μH, 10% RF Molded	1585-0069	Delevan	1025-64
L4	CH, 68μH, 10% RF Molded	1585-0069	Delevan	1025-64
L5	CH, 68μH, 10% RF Molded	1585-0069	Delevan	1025-64
L6	CH, 68μH, 10% RF Molded	1585-0069	Delevan	1025-64
L7	CH, 68μH, 10% RF Molded	1585-0069	Delevan	1025-64
L8	CH, 68μH, 10% RF Molded	1585-0069	Delevan	1025-64
	RELAYS			
K1	Relay, DPDT 12V Coil, 1 Amp Cont	1313-0021	Teledyne	712-12
K2	Relay, DPDT 12V Coil, 1 Amp Cont	1313-0021	Teledyne	712-12
K3	Relay, DPDT 12V Coil, 1 Amp Cont	1313-0021	Teledyne	712-12
K4	Relay, DPDT 12V Coil, 1 Amp Cont	1313-0021	Teledyne	712-12
	RESISTORS			
R1	Res, 1.305K, .25%, 1/10W MF	1074-0028	Dale	MF 1/10
R2	Res, 8.653 Ohm, .25%, 1/10W MF	1074-0001	Dale	MF 1/10
R3	Res, 1.305K, .25%, 1/10W MF	1074-0028	Dale	MF 1/10
R4	Res, 654.4 Ohm, .25%, 1/10W MF	1074-0024	Dale	MF 1/10
R5	Res, 17.42 Ohm, .25%, 1/10W MF	1074-0002	Dale	MF 1/10

UNITS ATTENUATOR, 3800 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
R6	Res, 654.4 Ohm, .25%, 1/10W MF	1074-0024	Dale	MF 1/10
R7	Res, 438.6 Ohm .1% 1/10W 25 PPM MF	1074-1051	Dale	MF 1/10
R8	Res, 26.42 Ohm .1% 1/10W 25 PPM MF	1074-1049	Dale	MF 1/10
R9	Res, 438.6 Ohm .1% 1/10W 25 PPM MF	1074-1051	Dale	MF 1/10
R10	Res, 438.6 Ohm .1% 1/10W 25 PPM MF	1074-1051	Dale	MF 1/10
R11	Res, 26.42 Ohm .1% 1/10W 25 PPM MF	1074-1049	Dale	MF 1/10
R12	Res, 438.6 Ohm .1% 1/10W 25 PPM MF	1074-1051	Dale	MF 1/10



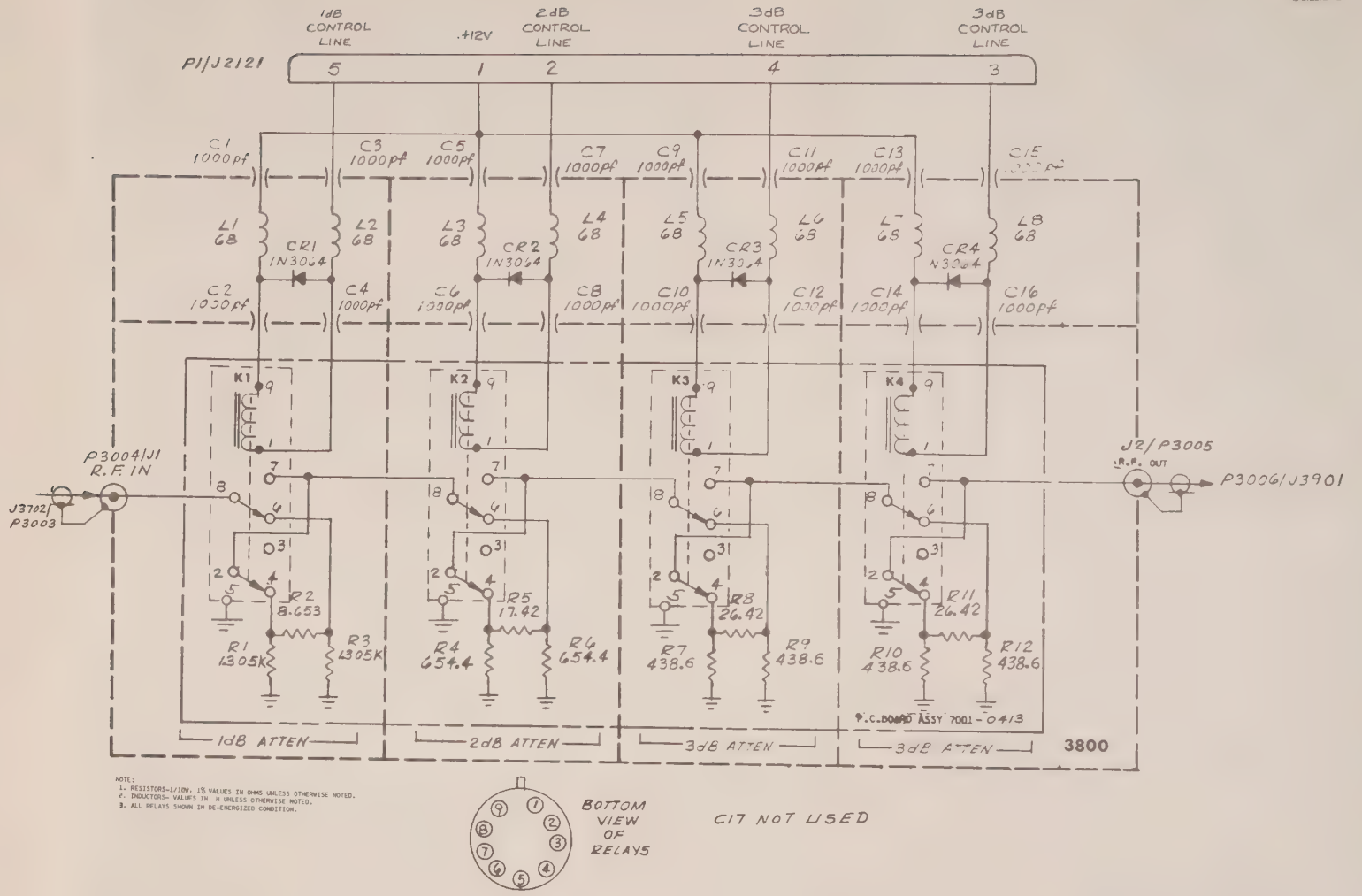


Figure 3-21. Units Attenuator, 3800

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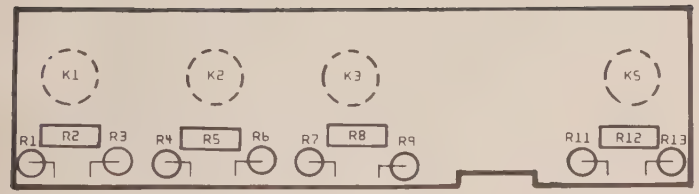
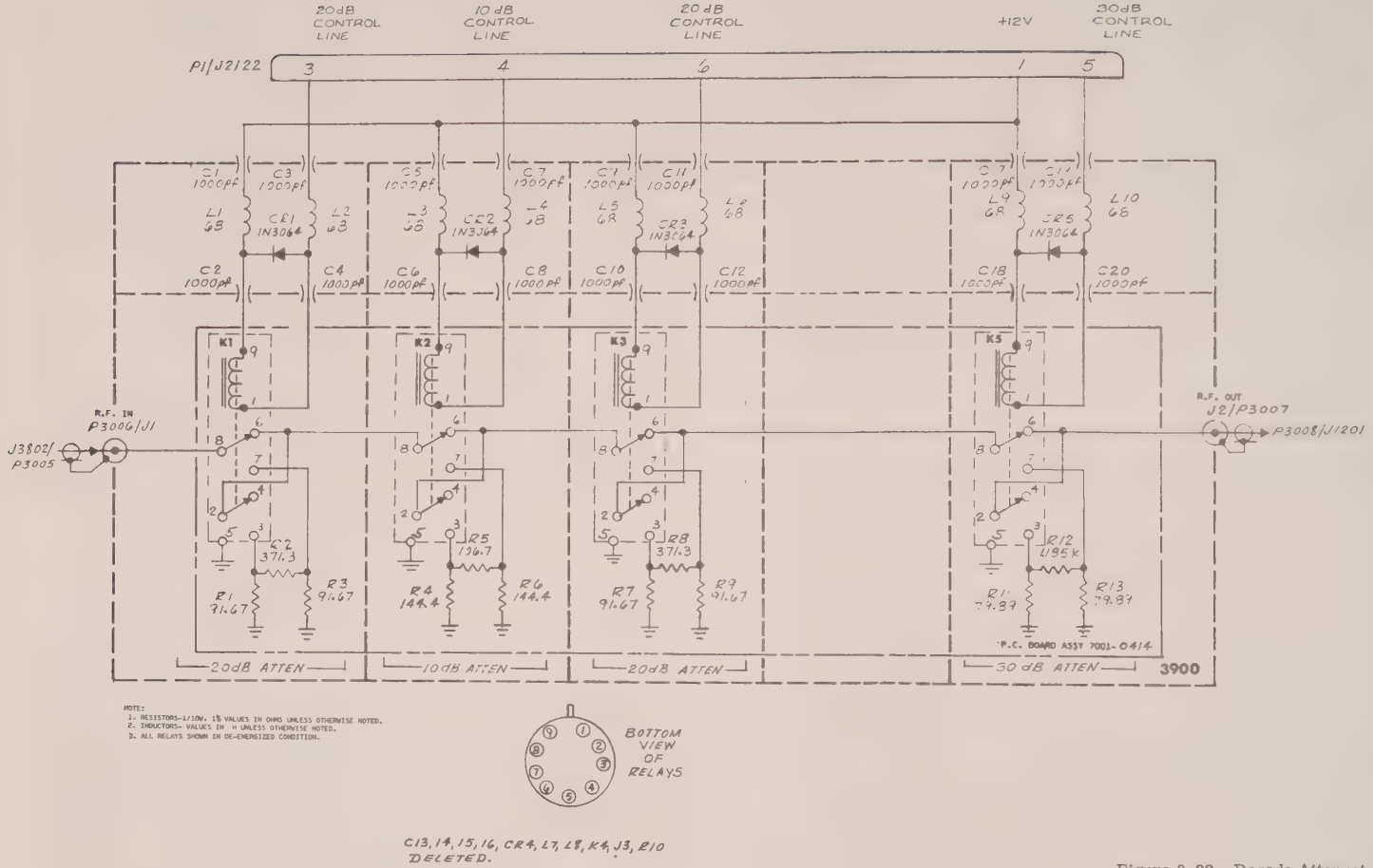
DECADE ATTENUATOR, 3900

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
3900	Attenuator Assy, Decades	7001-0414	Cushman	
	PC Board	1780-0560	Cushman	
	CAPACITORS			
C1	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C2	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
C3	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C4	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
C5	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C6	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
C7	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C8	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
C9	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C10	Not Used			
C11	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C12	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
C13	Not Used			
C14	Not Used			
C15	Not Used			
C16	Not Used			
C17	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C18	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
C19	Cap, 1000PF, 20%, 500V Feed Thru	1005-0008	Erie	357-001-X5U0-102M
C20	Cap, 1000PF, +100-0%, 500V Fd. Thru	1005-0101	Erie	2404-000-X5U0-102P
	DIODES			
CR1	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR2	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR3	Diode, 1N3064	1281-0013	Teledyne	1N3064
CR4	Not Used			
CR5	Diode, 1N3064	1281-0013	Teledyne	1N3064
	CONNECTORS			
J1	Conn, Mintr 75 Ohm Str Jk Bhd Mt Screw-on	2536-0065	Cablewave	700611NP
J2	Conn, Mintr 75 Ohm Str Jk Bhd Mt Screw-on	2536-0065	Cablewave	700611NP
	INDUCTORS			
L1	CH, 68μH, 10%, RF Molded	1585-0069	Delevan	1025-64
L2	CH, 68μH, 10%, RF Molded	1585-0069	Delevan	1025-64
L3	CH, 68μH, 10%, RF Molded	1585-0069	Delevan	1025-64
L4	CH, 68μH, 10%, RF Molded	1585-0069	Delevan	1025-64
L5	CH, 68μH, 10%, RF Molded	1585-0069	Delevan	1025-64
L6	CH, 68μH, 10%, RF Molded	1585-0069	Delevan	1025-64
L7	Not Used			
L8	Not Used			
L9	CH, 68μH, 10%, RF Molded	1585-0069	Delevan	1025-64
L10	CH, 68μH, 10%, RF Molded	1585-0069	Delevan	1025-64

DECADE ATTENUATOR, 3900 (cont)

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
	RELAYS			
K1	Relay, DPDT, 12V Coil, 1 Amp Cont	1313-0021	Teledyne	712-12
K2	Relay, DPDT, 12V Coil, 1 Amp Cont	1313-0021	Teledyne	712-12
K3	Relay, DPDT, 12V Coil, 1 Amp Cont	1313-0021	Teledyne	712-12
K4	Not Used			
K5	Relay, DPDT, 12V Coil, 1 Amp Cont	1313-0021	Teledyne	712-12
	RESISTORS			
R1	Res, 91.67 Ohm, .1%, 1/10W MF	1074-0037	Dale	MF 1/10
R2	Res, 371.3 Ohm, .1%, 1/10W MF	1074-0040	Dale	MF 1/10
R3	Res, 91.67 Ohm, .1%, 1/10W MF	1074-0037	Dale	MF 1/10
R4	Res, 144.4 Ohm, .1%, 1/10W MF	1074-0039	Dale	MF 1/10
R5	Res, 106.7 Ohm, .1%, 1/10W MF	1074-0038	Dale	MF 1/10
R6	Res, 144.4 Ohm, .1%, 1/10W MF	1074-0039	Dale	MF 1/10
R7	Res, 91.67 Ohm, .1%, 1/10W MF	1074-0037	Dale	MF 1/10
R8	Res, 371.3 Ohm, .1%, 1/10W MF	1074-0040	Dale	MF 1/10
R9	Res, 91.67 Ohm, .1%, 1/10W MF	1074-0037	Dale	MF 1/10
R10	Not Used			
R11	Res, 79.89 Ohm .1% 1/10W 25PPM MF	1074-1050	Dale	MF 1/10
R12	Res, 1.85K, .1% 1/10W 25PPM MF	1074-1052	Dale	MF 1/10
R13	Res, 79.89 Ohm .1% 1/10W 25PPM MF	1074-1050	Dale	MF 1/10





C13, 14, 15, 16, CR4, L7, L8, K4, J3, R10 DELETED.

Figure 3-22. Decade Attenuator, 3900

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REAR PANEL ASSEMBLY, 4000

CKT. REF.	DESCRIPTION	CE STOCK NO.	MFR.	MFR. NO.
4000	Pnl Assy, Rear	7003-0115	Cushman	
	CAPACITORS			
C1	Cap, .047μF, 10%, 100V	1005-0055	Aerovox	CK06BX473K
C2	Cap, .047μF, 10%, 100V	1005-0055	Aerovox	CK06BX473K
	FUSE			
F1	Fuse, 1 1/2 Amp 3AG S/B	1955-0018	Bussman	MDL-1-1/2
	CONNECTORS			
J1	Conn, BNC 50 Ohm Jk Isltd. Bhd Mt	2536-0066	Amphenol	31-010
J2	Conn, BNC 50 Ohm Jk Isltd. Bhd Mt	2536-0066	Amphenol	31-010
	INDUCTOR			
L1	Coil, Toroid .600x.975x.375 16GA Lot	1595-0001	Cushman	
	POWER CORD			
P1	Cord, Power 8 Ft. Gray Pl One End	3170-0012	Cushman	
	SWITCH			
S1	Switch, Slide 115/230V	1850-0012	Switchcraft	46256LFR
	TRANSFORMER			
T1	XFMR, Power	1575-0027	Cushman	
	FUSE HOLDER			
XF1	Holder, Fuse Blk Knrl Pnl Mt	1965-0015	Littelfuse	342-001AL

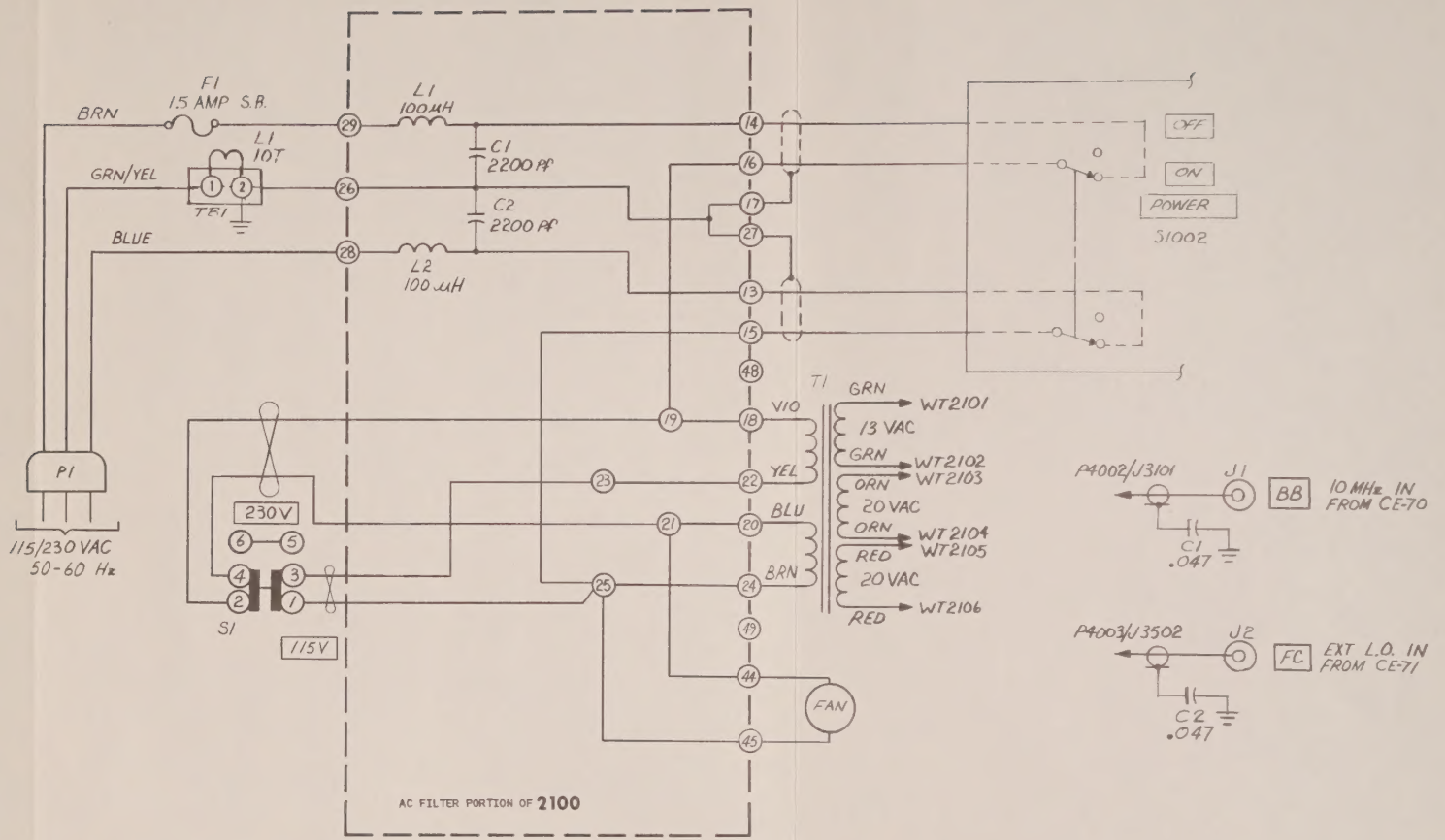

Figure 3-23. Rear Panel Interconnection Diagram, 4000

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MP MASTER
MA31807